



FEBRUARY 1961

National
**SAFETY
NEWS**

A NATIONAL SAFETY COUNCIL PUBLICATION

Let 'em have it
YOUR way

The secret of motivation
See page 28



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A NATIONAL SAFETY COUNCIL PUBLICATION

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THE COVER

A supervisor surveys the diverse group of workers he must motivate toward maximum safe performance. Photo courtesy *Better Living*, employee magazine of E. I. duPont de Nemours and Company, Inc.

40,000 copies of this issue were printed

National Safety News, February, 1961



straight to the point...

"WE KID YOU NOT!" Until now, the great majority of all safety shoes—including Lehighs—have been broader in the toe than most men want in the shoes they buy for sports or dress wear. This broad toe has been dictated by the shape of the steel box toe inside. Now Lehigh moves to the fore with a brand new, tapered, smarter looking steel toe shape that brings safety shoes into line with men's dress shoe design—without the slightest sacrifice in toe protection. Order a pair today for display in your plant. More men than ever will go for safety shoes with this smart new look.



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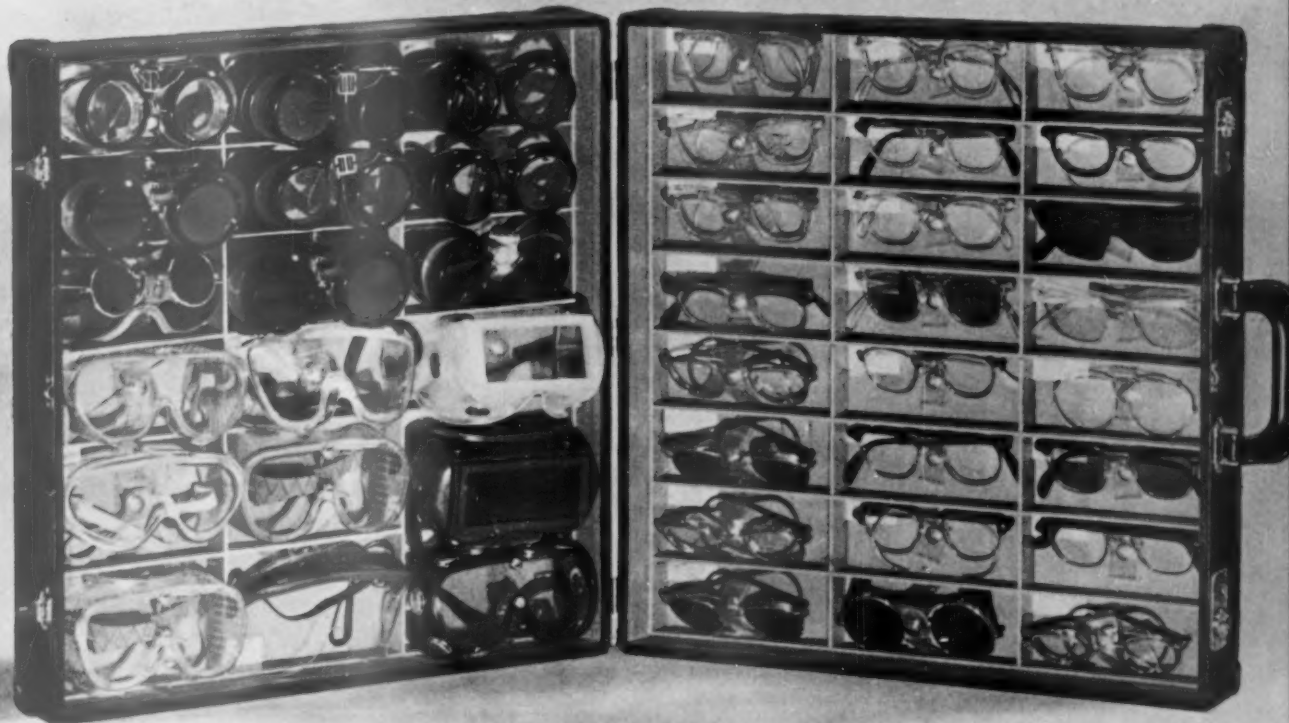
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Pittsburgh 8, Pennsylvania



EDITORIAL

THAT CARRIER FIRE

ANOTHER "Big One." In the first few days after the *Constellation* fire many a safety director found himself wide awake in the middle of the night with the question: "What if it happens to me?"

That, of course, is a futile reaction. A healthier way to deal with such a fear is to attack it . . . ask instead, "What can I learn from this to make sure it doesn't happen to me?" Is the welding properly supervised on our construction project? Are our flammables stored properly? Is there a tank valve located where it could be damaged and begin leaking? Can the men get out if trouble starts?

Back in the days when horse-stealing was a problem, a phrase was invented that described this kind of hindsight. It was known as "locking the barn door after the horse was stolen." Even hindsight is better than no sight, and benefitting from someone else's misfortune is really more like foresight. It was this kind of thinking that led to more thorough knowledge of how to handle ammonium nitrate after the Texas City catastrophe. Livonia taught several lessons, and several will come from the New York fire, too. None of these lessons from the past can be ignored. When one is ignored, trouble follows eventually.

Someone violates an elementary safety principle, and an unbelievable disaster results. Like a dry fuse waiting to be lit, a train of violations, if they fall into the right sequence, can lead to wholesale destruction. All it takes to light a fuse is the touch of a live coal . . . all it takes to set off that train of violations leading to a catastrophe is the initial small lapse.

To see that such a small lapse does not occur, not only safety personnel, but every operating employee, must insist on approved practice at every moment at every point in production.

Guarding against a million-to-one chance can be monotonous and unrewarding. (Anyone on speaking terms with Univac is welcome to present it with conditions that might lead to a fire in the \$100,000,000 price range, and come up with a closer ratio than our conversational "million-to-one.") Whatever the actual probability, no one can tell which little violation is the one that will lead to the big payout. To protect against it, a company needs:

- Airtight regulations enforced by management.
- Trained and indoctrinated employees.
- Supervisors alert to violations and unsafe conditions.

These three are the core of an industrial safety program. They will prevent the small ones, and preventing the small ones will prevent the big ones.

But every few years a big one comes along—Texas City, Livonia, and now Brooklyn. And safety men wake up in a cold sweat wondering, "What little accident in the shop could burn us down? What haven't we done that just might—on that million-to-one shot—burn us right out of business?"

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THE SAFETY VALVE



Nothing human is alien to me
—TERENCE

SAFETY DEFINITION

How's THIS for an interpretation of safety? . . .

"Safety comes from man's mastery of his environment and of himself. It is won by individual effort and group cooperation. It can be achieved only by informed, alert, skillful people who respect themselves and have a regard for the welfare of others."

Saw the above in *Safety Standards*, a publication of the U.S. Department of Labor, which credited it to the *New York Times*. It's worth framing — and remembering.

GROWING PAINS

MAN'S FECUNDITY is causing much anxiety on the global level. How long will it be before the world's population reaches the point where the earth can no longer support it?

More immediate are the problems that a growing population brings to every metropolitan area. Each new family needs many municipal services as well as additional housing.

Each 100 families, for example, will eventually require 2.2 grade school rooms, 1.65 high school rooms, an acre of land each for a grade school, a high school, a park and playgrounds, .84 of a policeman, .67 of a fireman, and 4 employees to clean streets, collect garbage, collect taxes, look after parks and health, and many other services.

Then, each 100 families might be expected to add 140 automobiles to an already heavy traffic load. More and more people are using their cars to get to work, singly or in car pools. This trend has been increased by the migration of business and industry to outlying areas which may lack adequate mass transportation.

These estimates were made for Milwaukee County, Wis., but they'd fit most other metropolitan areas.

The automobile helped to create the modern city, and now motor traffic is threatening to strangle it. Superhighways tempt more people to drive into town to compete for inadequate parking space.

That's what happened in Chicago, when two expressways were opened recently. Getting to the city from outlying areas was a breeze — until you came to one of the Loop exits at rush hours. Then anxious cruising looking for a parking space.

During the recent holiday season you could often walk from Michigan Avenue to the Northwestern

Station quicker than you could get there in a wheeled vehicle.

I was reminded of the remarks made by Mayor Morrison of New Orleans at the launching of a fleet of 68 new streamlined buses by New Orleans Public Service. He reminded the public that the traffic situation in the city would be intolerable if everybody using the transit system tried to use private cars.

And where would Chicago be without the "L," subway, and suburban railroads?

WHERE PEOPLE EAT

PLANT CAFETERIAS aren't expected to make money. Management usually makes up the deficit as an investment in employee good will. But if food and service don't please, the money goes down the drain or into the garbage can.

Pleasing people with food is a tough job — both at home and in restaurants. Preparing it is a messy operation and maintaining cleanliness and sanitation takes constant supervision.

If plant eating facilities are not satisfactory, the company gets the blame, whether it operates the cafeteria itself or employs an industrial caterer.

What are the chief gripes? Next to weak coffee, most of the complaints involve unappetizing conditions. Here are a few:

- Poor dishwashing. Machine-washed utensils are usually safe enough bacterially, but lipstick and dried egg are revolting.
- Foreign objects in food.
- Dirty tables and counters; cleaning them with a dirty rag.
- Dirty uniforms on serving personnel.
- Dirty hands preparing or serving food.
- Mopping the floor while patrons are eating.
- Washing the floor with strong-smelling detergents. Phenol and chlorine are good germ killers, but the odors don't go with food. They're particularly objectionable to women.

The above list is just a starter.

ON THE HOUSE

ONE FOR THE ROAD: The five Fred Harvey oases on the Illinois Tollway announced they would serve coffee to motorists New Year's Eve between 9 p.m. and 6 a.m., — on the house. The idea was to stop the drivers for a rest, to combat driver fatigue and promote highway safety.

The Harvey organization got a lot of publicity in the newspapers and on TV, but who would argue that they didn't deserve it?

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DIARY OF A SAFETY ENGINEER

(Fiction)

By BILL ANDREWS

The new boss writes a memo that puts the squeeze on the Project safety program



ARGUMENT

February 1, 1961

THE NEW HEAD of our project is a very demanding man!

He was gracious enough in our first meetings. He showed a real interest in my work and a fairly good amateur's knowledge of the general principles of safety program work. I did almost all the talking in our first interview, and he took a few notes.

A week later I received the following memo from him:

"In view of the fact that the Project is only a real estate and service organization, renting land to industrial firms and offering them a few utility and management services, how do you justify the extensive program of direct inspections conducted by the Project's safety staff? Would it not be more in keeping with sound management procedures to confine your work to (1) inspecting the project only to keep alert to hazards jeopardizing the industrial community in general; and (2) offering a consulting safety engineering service to the individual firms which ask for it?

"I raise this point very sharply, for I note that your 1961 budget request contains provision for a third junior safety engineer. If my thinking is right, your staff needs no enlargement and might be cut.

"Economy is one reason behind

my proposal, but the more basic reason is a reluctance to have the Project staff — essentially merely a landlord's staff — intervening directly in the affairs of tenant companies.

"Let me have your answer in a brief memo."

I did not discuss the memo with my staff, since it would produce anxieties about job tenure. But I wrestled with it myself at length, and the memo in reply to the boss's read like this:

"I believe the present policy of Project-wide inspections by the Project safety staff is necessary and that my proposed expansion of staff is justified for these reasons:

"1. It is not possible to inspect for hazards which might jeopardize the whole community without making the detailed type of inspection which uncovers hazards jeopardizing workers in a single area. Big accidents do not often have their cause in large and conspicuous shortcomings. So community protection demands detailed inspection.

"2. No management on the Project has indicated that it objects to our reporting inspection results which lead to jacking up their supervision and employees. Where there has been friction with managements in the past, it has almost

always been in the area of the type of inspection report which called for expensive alterations in plant based on community-wide danger.

"3. Employees in plants on the Project are drawn from the nearby towns, and there is considerable contact between employees of the different companies. There is a great deal of shifting of employees from plant to plant on the Project. Under such conditions, the maintenance of fairly uniform standards of accident prevention is especially important. Our experience last summer after the candy factory explosion shows the safety problem of the various enterprises located here is really one problem.

"I will be glad to expand on these points either in writing or orally."

The day after I wrote this, the boss called me into his office and cross-examined me at length. He evidently thought I was simply an ambitious bureaucrat over-promoting his own department for selfish reasons, and I had a hard time keeping my temper so I could answer him quietly and reasonably.

I think he sensed this anger in me and guided the conversation to other aspects of the safety program: engineering, consultation, design,

— To page 60



Which Came First **in eye ?** **protection ■**

First came the need! For nearly 27 years safety spectacles had been made in the same old-fashioned styles. The safety engineer's job of getting employee acceptance was a difficult task. Then, in 1954, with the blessings of cooperating safety engineers, U. S. Safety developed and manufactured a new style spectacle and lens shape. The style barrier was broken! The job of getting protective eyewear acceptance became easier. This is only one example of how the pulse of the industry reflects the heartbeat at U. S. Safety. First to fill your needs is the big objective of our entire research, manufacturing and sales facilities. And now for 1961, U. S. Safety introduces a new dimension in eye protection with the ALL-NEW 3-D Line of Safety Eyewear. It's the biggest advancement since the style barrier was broken!

1ST to offer a one piece plastic eyeshield. FIRST with an all-plastic spectacle eyeshield. FIRST with soft-side, flexible frame all-plastic goggles. FIRST to introduce stainless steel screen ventilation integrally moulded into flexible frame all-plastic goggles. FIRST with allyl-resin type plastic safety lenses in both plano and prescription in accordance with Federal Specifications. FIRST to offer colored safety frames with cosmetic appeal. FIRST to introduce five barrel hinges on metal safety frames. FIRST to offer flat fold sideshields. FIRST with integrally moulded two-tone colors. FIRST with the hexagon head temple screw. FIRST with safety flange lens channels. FIRST with aluminum temples.



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3-D... Design, Desirability, Durability. All combined into a new dimension in eye protection. Modern styling is adapted to safety eyewearer's more rugged requirements. The 3-D Line features longer life with sustained extra strength. Maximum comfort and style assures wearer acceptance.

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ACCORDING TO
Z16...

WORK
CONNECTED

DAYS
LOST

PERMANENT
DISABILITY

ESTABLISHED
JOB

By **H. GENE MILLER**
Manager,
NSC Research and Statistics Dept.,
and member,
Z16 Committee on Interpretations

Interpreting the Injury Standard

WHEREVER THERE IS interest in safety, there is interest in records. And wherever there is interest in records, there is interest in what goes into records.

Standard Reporting Procedure. Safety records are of maximum usefulness only when they mean the same thing to all people. To accomplish maximum usefulness, the standard injury reporting procedure has been developed. (*American Standard Z16.1, The American Standard Method of Recording and Measuring Work Injury Experience*.*.)

In addition to covering methods of calculating work injury rates, this Standard defines the kind of work-connected disabilities which should be included in the rates.

Definition of Standard Injury. Basically and simply stated, a disability should be included in the injury rates if: It arises out of and in the course of employment; and it renders the injured employee unable to perform a regular job for a full day, or it results in some permanent disability.

Disabilities have the unhappy characteristic of not always falling into neat classifications. Most do, but quite a few don't. There seems to be no limit to the variety of circumstances under which workers hurt themselves.

Even with a standard, questions arise because it is not always clear whether a particular injury circumstance should be classified as an activity of employment.

Principles for Deciding Cases. *An injury must be work connected.* To help the safety man determine whether a disability (injury or disease) should be included in the injury rates, first, he should make an honest appraisal of the disability in terms of the worker's employment. Did the disability arise out of and in the course of employment — i.e., was it work connected?

To help answer this question, the Standard defines employment:

(a) All work or activity performed in carrying out an assignment or a request of the employer, including incidental and related activities not specifically covered by the assignment or request.

(b) Any voluntary work or activity undertaken while on duty with the intent of benefiting the employer.

(c) Any activities undertaken while on duty with the consent or approval of the employer.

With the specific definition of employment given here, it shouldn't be difficult in most cases for the safety man to determine whether a disability is work connected.

An employee must be unable to work for a full day. In addition to being work connected, an injury

would be included in the injury rates only if the injured worker were unable to work for a full day following the day on which he was injured, or the injury resulted in some permanent impairment.

Stated more specifically, the Standard requires that an injured worker must be unable to work during the entire time interval corresponding to the hours of his shift, on any day following the day of injury.

This also means that if a worker were injured on Friday and he wasn't scheduled to work again until Monday, the injury would be reportable if he was *unable to work* on Saturday or Sunday (even though he was not scheduled to work on these days). The same condition applies to holidays.

Committee on Interpretations. To promote uniformity in interpreting the Standard and accomplishing uniformity in injury records the Standard provides for a Committee on Interpretations.

If a safety man is in doubt whether an injury should be included in his company's injury rates, an opinion may be requested from the Committee on Interpretations. To accomplish this, nine copies of a full report of the circumstances of the injury should be submitted to the American Standards Association, 10 E. 40th St., New York 16.

The Committee on Interpretations rules on questionable cases, but it usually takes considerable time to complete a review of a case. In addition to the period required by the safety man to write up the case and send it to the American Standards Association, it takes time for

— To page 100

This is the first of a series of articles calculated to produce a better understanding of the standard injury reporting procedure, accomplish more uniformity in the classification of injuries, and permit the safety man to rule on more of his own cases. Points mentioned briefly in this introductory article will be discussed more completely in future issues of NSNews. It is planned that each article will deal with only one item. Wording and intent of the Standard will be detailed and will include rulings by the Committee on Interpretations. Readers interested in records are urged to clip these pages for future reference.

*Copies of *American Standard Z16.1* are available from the American Standards Association, 10 E. 40th St., New York.

Where was the Bell Telephone System

ON FRIDAY, AUGUST 12, 1960?



It was handling some 210,000,000 local and long distance conversations, plus about 5000 overseas calls.



It was guiding Echo I into near-perfect orbit so Bell System scientists could make the world's first telephone call via satellite.



It was developing a world-wide communications system using satellites powered by the Solar Battery, a Bell System invention.



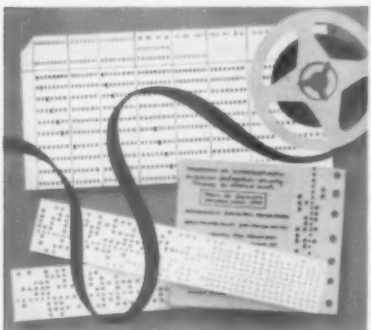
It was offering Bellboy personal signaling to more and more people. Device uses tiny Transistors, another Bell System invention.



It was building fast, reliable communications for BMEWS—the nation's Ballistic Missile Early Warning System.



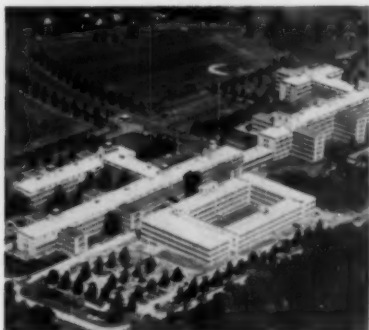
It was constructing a 'round-the-world' communications system for America's first man (or woman) into orbit.



It was providing circuits for the speedy transmission of mountains of data for business and government.



It was providing thousands of miles of high-quality circuits for the country's local and network television programs.



And it was delving into innumerable fields of scientific inquiry at the largest industrial laboratories in the world.

It was at the scene of every major communications activity that day, as it is every day.

And for them all—communications on the ground, under the oceans, through the air, around the world—Bell Telephone people "wrote the book that everybody else uses."

How come? Because it's our job to be expert in universal communications.

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BELL TELEPHONE SYSTEM *Pioneering in outer space to improve communications on earth*

VOICE OF THE READER



Comments on topics of current interest are invited. They need not agree with the views of the editors

Wants Your Bulletins

SANFORD, N.C. Since joining Saco-Lowell Shops a few weeks ago I have been actively working with our safety program. I am presently publishing a safety bulletin for members of the safety committee and supervisors.

I believe my bulletin content and makeup could be improved greatly if I were given the opportunity to observe other companies' safety bulletins and newsletters. I would appreciate having some of your readers place my name on their safety bulletin mailing lists; I would be happy to reciprocate.

— ROBERT E. HERNDON
Personnel Administrator
Saco-Lowell Gear and
Machine Division

We'll Do Better

DETROIT, MICH. I was just glancing through the November issue of the NATIONAL SAFETY NEWS and my attention was drawn to the photograph shown on page 50. This photograph is in conjunction with a safety article about blind people, and the illustration shows a blind man operating a drill press. Obviously, we who have been in the safety movement for a number of years are always looking at things critically, and as a result, I cannot help but call attention to the fact that this man working on the drill press has:

1. Exposed drive belt.
2. A wristwatch.
3. Improperly rolled sleeves (although fairly high).

My attention is then drawn to the second and third paragraphs of the article itself at the top of page 50 which indicates that this man uses every bit of safety equipment that he can possibly use. Now, it seems to me that we are inconsistent in showing such unsafe conditions and acts in a safety article.

My point in writing this to you is this—could there not be some setup whereby all photographs shown in NATIONAL SAFETY COUNCIL publications would be reviewed for these unsafe conditions and acts before they could be approved for publication?

— K. S. HEDGES
Safety Director
General Motors Corp.

Mr. Hedges is right on all three counts. About ten days before his letter arrived, we had set up a new, tighter review arrangement between the editors of NATIONAL SAFETY NEWS and the Industrial Department.

Eye-Foot Protection Survey

CHICAGO. I thought you would like to know how much interest and attention was created among the advertising people of both companies and agencies by the survey article "Five NSC Sections Probe Eye, Foot Protection" that appeared in the December issue.

Several agencies and companies asked for extra copies. These people in a number of ways expressed the thought that this type of article and information was extremely

valuable not only to them as advertisers, but they also felt that it would be helpful to safety men in the plant in selling the importance of safety items appearing in the survey.

Needless to say, I am most happy to be able to report that this was considered a job well done based on the numerous comments that I have received from various contacts that I have made.

— LEONARD A. WOODS
General Manager
MacIntyre-Simpson & Woods

MacIntyre-Simpson & Woods is the company that represents NATIONAL SAFETY NEWS in advertising sales. Their salesmen have been calling on our advertisers for more than 30 years.

Forge Shop Lighting

CHICAGO. The article on pages 10 and 11 of the January 1961 issue of NATIONAL SAFETY NEWS is very interesting to me, and I would appreciate having tear sheets of this article. There is one plant in our city that doubtless will be interested in having this information, for they have a forge shop with substandard lighting.

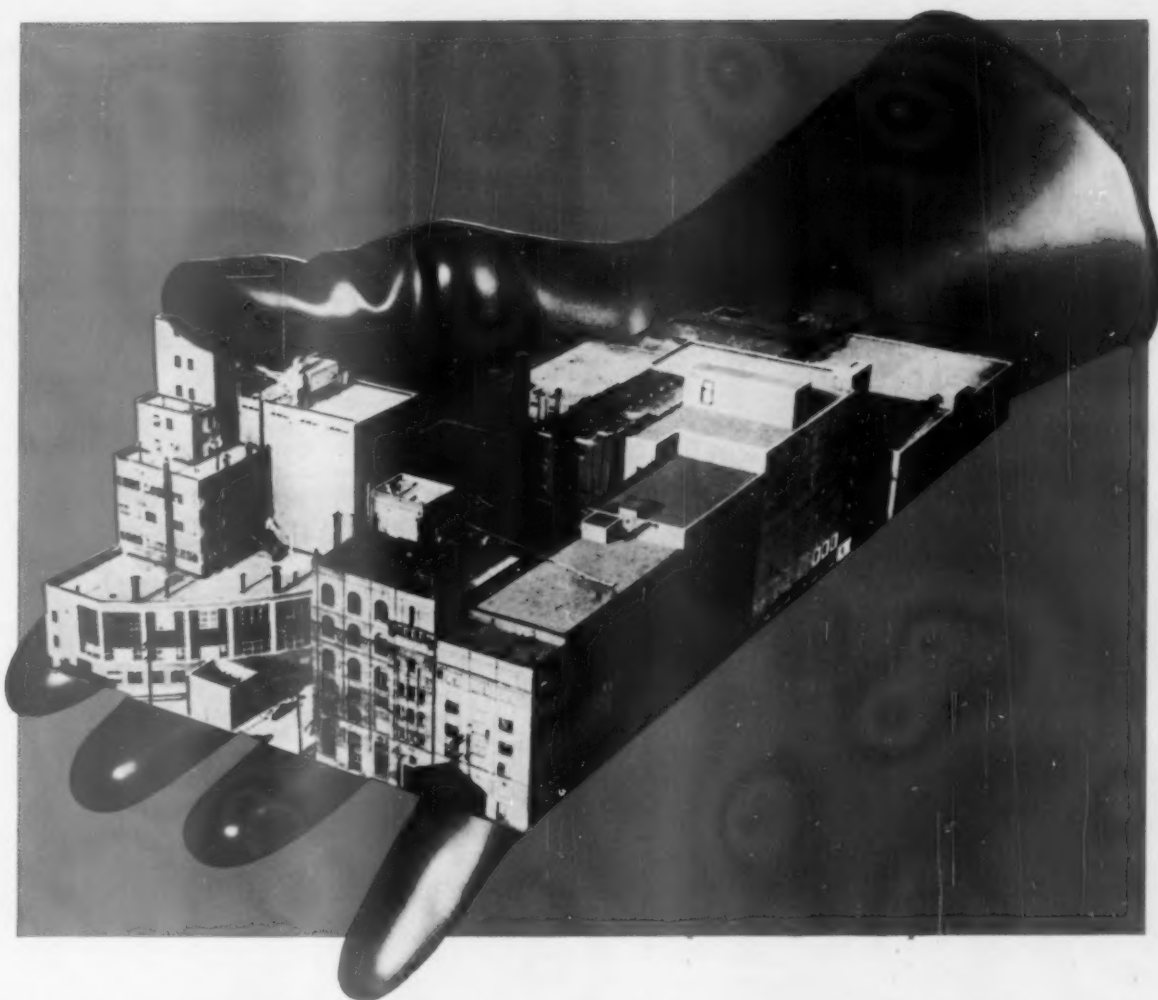
— JOHN M. SANDELL
Consultant
Marsh & McLennan, Inc.

Finds Design Article Useful

URBANA, ILL. Your article ["Design It Right . . . Build Safety In"] in the NATIONAL SAFETY NEWS for January is most helpful and I would like to make use of it with several of our departments at the University. I wonder if you already have it in printed form, other than in the magazine, and could send me five or six copies?

. . . It is the sort of material we look for in data sheets from the Council and I would like to see a data sheet developed using your article as a basis, since it states so effectively some of the most important principles in environmental safety.

— JOHN MORRIS
Safety Coordinator
University of Illinois



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INDUSTRIAL GLOVES

Poly-D
Natural Rubber
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WIRE FROM WASHINGTON



By **HARRY N. ROSENFELD**

Washington Counsel, National Safety Council

NEW BROOM How Clean a Sweep?

A NEW ADMINISTRATION and a new Congress came to Washington in 1961.

The New Administration. Immediately after election day, President John Kennedy set in motion a study of the federal regulatory agencies, including those dealing with transportation. The resulting report by James M. Landis contains these comments on transportation:

1. "The prime and immediate need is for developing and coordinating policy immediately at a high staff

level. The greatest gaps . . . are in the planning for foreseeable problems."

He urges that "an articulate national transportation policy . . . be ground out by the process of coordination," not only among the federal agencies involved but also "with various state and municipal agencies in order to deal with problems of a local or regional character."

2. "The commutation crisis that was apparent a decade ago has had little or no effective help from the federal government . . ."

3. He recommends creating "with-

in the executive office of the President an office for the coordination and development of transportation policy to develop and implement a national transportation policy," and suggests that such office be given all responsibilities now vested in the Undersecretary of Commerce for Transportation. This new office "would need no regulatory powers."

4. He sets forth "a tentative program of what could be accomplished through such an office by way of immediate objectives and longer range objectives." Of the 10 specified "immediate objectives" the first two are:

a. "The achievement of a program for the amelioration of interurban public transportation, including the establishment of metropolitan transit commissions with federal aid in the form of matching guaranteed loans for the acquisition and improvement of facilities and equipment . . ."

b. "Formulation of policies to coordinate federal highway aid programs with approved metropolitan transit plans, so as to promote the economic soundness and efficiency of metropolitan public transportation systems as a whole, with emphasis on the avoidance of traffic congestion and the decline of public transportation."

In releasing the Landis Report, President Kennedy said:

"This is a most important and impressive analysis of the regulatory agencies which deserved the attention of the members of Congress as well as the agencies themselves."

He also appointed Landis as special assistant to the President in connection with these proposals.

The President also established a special task force on distressed areas to draft a program for economic revival in areas of chronic unemployment. The committee divided itself into seven panels, each with assigned fields.

One such panel deals with highway programs, among other matters; another's assignment includes mine safety. The resulting report placed great emphasis on highway construction among the public works that could help such distressed areas. Highway construction was so conceived not only in emergency terms, but also as part of area redevelopment legislation and long-range planning. Local and regional access roads, in particular, were stressed, as well as full state use of federal-aid highway funds.

The report urged "the criteria

— To page 104

THIS MONTH IN WASHINGTON

- President John Kennedy authorizes and receives a new report studying federal regulatory agencies, including those dealing with transportation.
- U.S. Department of Labor announces injury rate for manufacturing in third quarter of 1960 was 11.9 disabling injuries per million man-hours — a 7 per cent increase over the second quarter but an 11 per cent decrease over 1959's third quarter.
- U.S. Department of Labor issues new safety and health regulations for federal supply contracts under the Walsh-Healey Public Contracts Act.
- Interstate Commerce Commission issues new rules governing monthly reports of railroad accidents under Accident Reports Act. Reportable accidents are: train accidents, train-service accidents, and nontrain accidents.
- Atomic Energy Commission issues proposed regulations formalizing procedures by which the public may participate in safety considerations of Commission-owned power reactors installed at non-AEC sites as part of conventional electric utility systems.
- Federal Radiation Council invites comments on problem of providing guides to be used in the control of human exposure from environmental contamination with radioactive materials.

This report is an information service. Publication does not imply National Safety Council approval of or opposition to any legislation mentioned



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FREE!

Send
for
complete

ATLANTIC INDIA CATALOG #52
of industrial rubber parts



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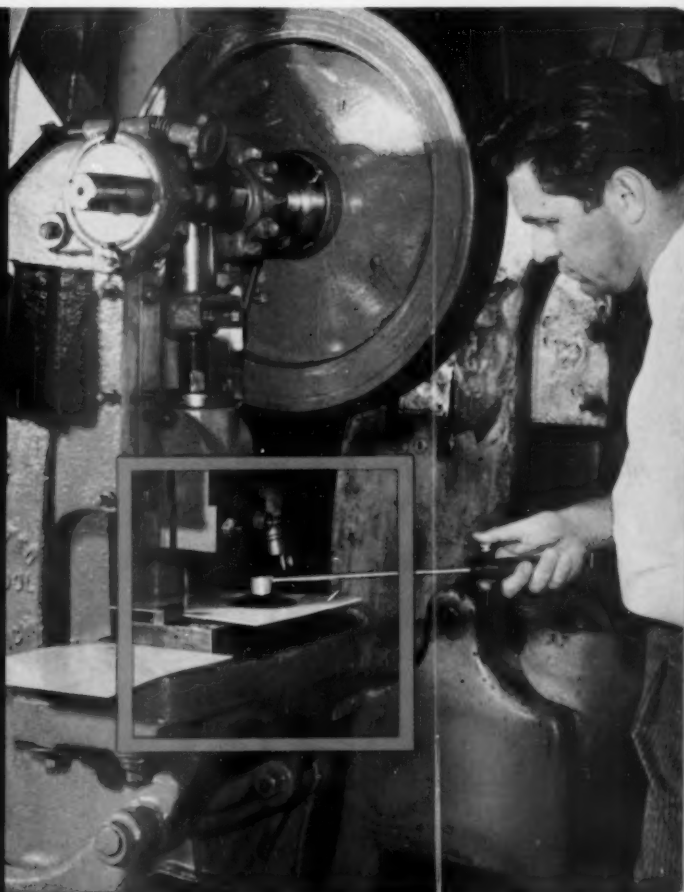
stay safe...

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ATLANTIC INDIA

VAC-U-MATIC

LIFTER



...REDUCE PERSONAL INJURY, ELIMINATE COSTLY DAMAGE,
INCREASE OUTPUT PER MAN, REDUCE PRODUCTION TIME

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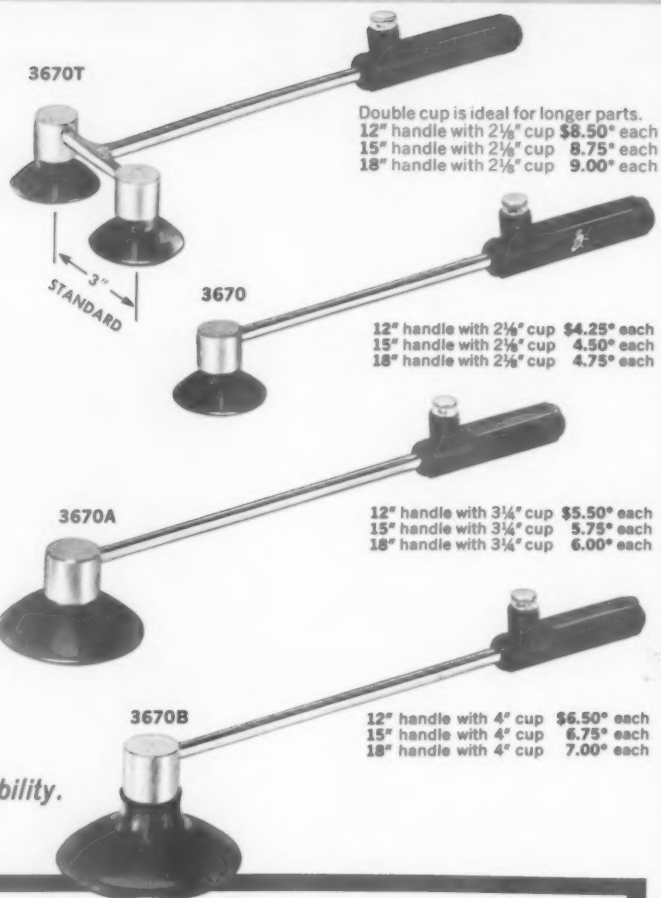
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ATLANTIC INDIA

PUNCH PRESS VACUUM LIFTERS

- ★ Grip and hold oiled or dry sheet metal—glass, plastics, and other smooth surfaces
- ★ Keep operator's hands safely away from action of ram—release parts quickly
- ★ Speed production work as much as 25%—increase efficiency of operator
- ★ Available in 2½" to 4" cup diameter—12" to 18" handle length

All metal parts are precision made for extra durability.



Atlantic India vacuum lifters are specifically designed to speed punch press work and eliminate personal injuries. Accidental loss of fingers will cost your company many thousands of dollars. Atlantic vacuum lifters on the job prevent such costly personal injuries.



Other time saving uses for Atlantic India punch press lifters are found wherever smooth-surface materials are used. Ideal for plastic molding, metal fabricating, glass handling and other industries where smooth, non-porous surfaces are used.



Atlantic India vacuum lifters are real time savers on the production line, too! Ideal for lifting molded pieces, and extra fast in handling flat surface materials on the line. Many other uses are being found daily in manufacturing and warehousing concerns across the country.

*Prices effective: Sept. 1, 1960 and are subject to change without notice. Also made to your specifications.

VACUUM LIFTERS



LITTLE GRABBER LIFTER

One finger lifter ideal for light objects or raising corners for a better grip. Always handy and ready for use yet leaves hand free for other work. Special design release tabs. Made from tough neoprene compound.

No. 1230— $2\frac{1}{8}$ " cup diameter **\$15.00*** per hundred

No. 1230-1—Same as 1230 except no release tabs. **\$15.00** per hundred



KNUCKLE SAVER LIFTER

Two finger grip for extra lifting capacity. Its extra strong lift makes this Atlantic India lifter ideal for greater loads. Breaks oil adhesions easily.

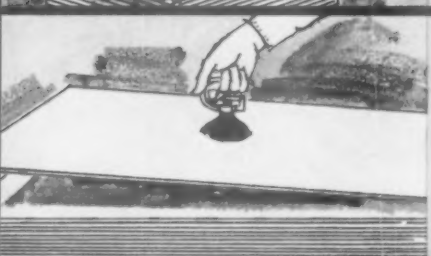
No. 3825— $3\frac{1}{4}$ " cup diameter **\$60.00*** per hundred



MEDIUM DUTY LIFTER

Sturdy construction and fast action metal release valve for safe, quick handling of smooth surface materials. Full hand grip for extra strength gives operator extra freedom of movement.

No. 2260— $3\frac{1}{4}$ " cup diameter **\$3.00*** each

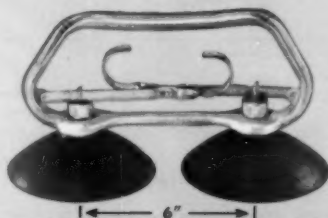
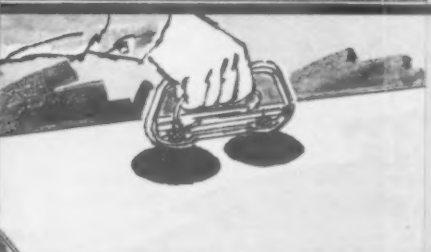


HEAVY-DUTY SHEET METAL LIFTER

Saves wear and tear on gloves and hands and speeds work greatly. Generally used for loading, unloading, piling and shifting sheet metal from trucks, stock, etc. Handy trigger valve for safe, quick release.

No. 1859—4" cup diameter **\$5.50*** each

No. 1912—5" cup diameter **\$6.00*** each

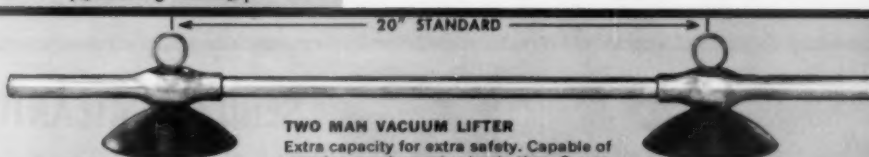
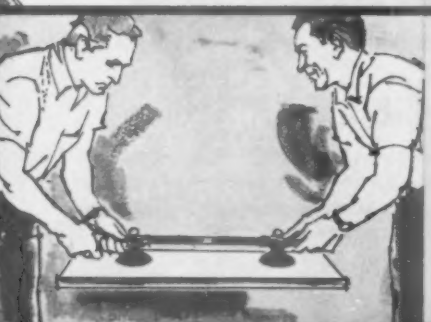


DOUBLE CUP SHEET METAL LIFTER

Convenient handle for one or two handed lifting. Unless limited by size, we strongly recommend the 5" cups. They are capable of lifting weights far in excess of the operator's muscular capacity. Positive grip increases operator's working capacity. Trigger valves.

No. 1860—2 cups 4" dia. ea. **\$9.50*** each

No. 1923—2 cups 5" dia. ea. **\$10.50*** each



TWO MAN VACUUM LIFTER

Extra capacity for extra safety. Capable of carrying much greater loads than 2 men can carry. Ideal for moving heavy gauge metal, marble slab and heavy plate glass. Can be furnished with any reasonable distance between cups. With vacuum valves.

No. 3700

No. 3750

2 cups 4" dia. ea. **\$12.00*** each

2 cups 5" dia. ea. **\$13.00*** each

ATLANTIC INDIA

Satisfaction Guarantee



Atlantic India VAC-U-MATIC lifters are all guaranteed to perform as described or your money back.

All VAC-U-MATIC cups are made from a flexible, tough Neoprene compound capable of withstanding considerable wear and abrasion. It is resistant to the effects of oil.

Normal care will greatly increase the useful life of your VAC-U-MATIC equipment. Breaking the vacuum should always be done with the quick-action release valves.

Replacement cups are available for all Atlantic India lifters at nominal cost.

TRIAL ORDER FORM

GENTLEMEN:

PLEASE SEND ME:

QUANTITY

VACUUM LIFTER NO.

CUP DIAMETER

☐ ENCLOSED IS \$ _____ IN FULL PAYMENT ☐ PLEASE BILL ME

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

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It's free! Atlantic India Catalog #52 contains 158 pages of rubber parts, complete with all measurements. Like having a complete inventory of industrial rubber parts right in your own plant—also contains general information you will be glad to have on hand. Write today . . . it's free!

Oct. 25, 1960

Dear Boss:

Here's what I learned at the
National Safety Congress ...

**This plant nurse
was no passive observer,
and her letter proves it**



From: Ruth Hammon, R.N.
To: E.S. Knepper.
Subject: Report of the National
Safety Congress and Exposition.

IT WAS my good fortune to again attend the 1960 National Safety Congress in Chicago. As I will be serving as membership chairman for the Occupational Health Section for 1960-61, my first meeting consisted of breakfast with the outgoing and incoming membership chairmen of each section of the Council.

At the first meeting of the Occupational Health Nursing Section the general chairman, Miss Dorothy Armstrong, presided. Our program for that session concerned "Vision in Industry" and included:

Stella Bruggen, R.N., consultant, Illinois Society for Prevention of Blindness, Chicago; Dr. Earl M. Merz, ophthalmologist, Chicago; and James O'Neil, director, Industrial Service, National Society for Prevention of Blindness, New York City.

Dr. Merz listed the types of injuries from industry most commonly seen by the ophthalmologist:

1. Deeply embedded foreign bodies.
2. Deep lacerations.
3. Chemical burns.
4. Flash burns.
5. Mechanical injury as a result of being hit by or running into an object.

Dr. Merz and Miss Bruggen stressed that, if a foreign body can-

not be removed by irrigation or a moistened applicator, the eye should be covered and examined by an ophthalmologist immediately.

In the case of chemical burns it is important for the nurse to irrigate the eye as soon as possible and for a 10-min. period, forcing the lids open so the solution may reach all of the eye.

Dr. Merz said a prognosis on chemical burns is always guarded. At least 48 hours are needed to know the results, since any degree of scarring can occur.

The doctor also sees some cases of conjunctivitis. However, he believes very few cases coming from industry are the result of dirt or

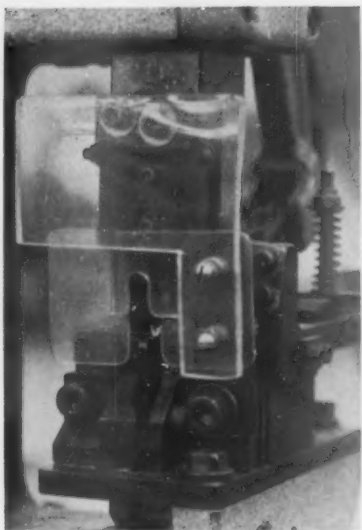
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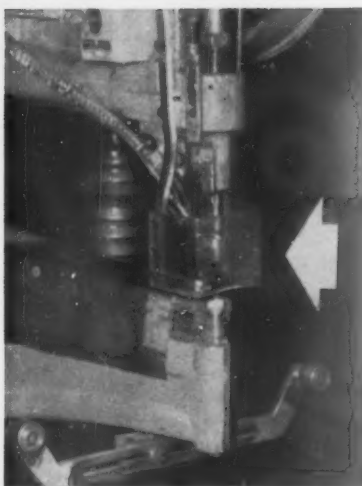
SAFETY CAN BE CHEAPER

◀ The cutting bit is not the only source of danger to the operator of drill presses. The revolving spindle is also hazardous. The neat plastic clip-on guard shown keeps worker's hair or clothing from being reeled up. COST: Less than \$5.

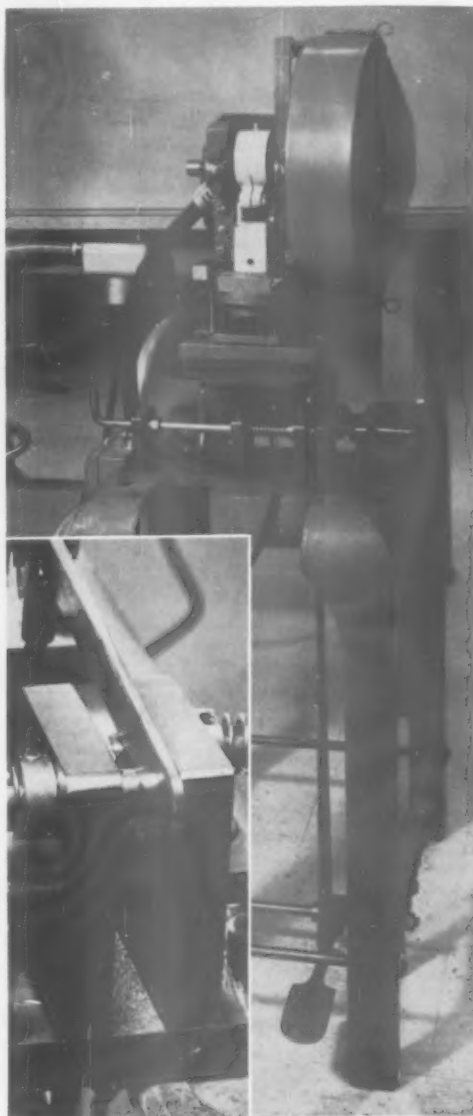
▼ Before the foot trip pedal of this machine can be depressed, both hands must be used to hold aside the pins and allow passage of the actuating lever. The mechanical two-hand control was machined of scrap stock. Note — in the inset — that the underside of the pins are beveled to allow the lever to return to the safe position, even when the sprung pins are not held apart. COST: \$5 and 8 hours labor.



◀ Here several pinch points on a clip-forming tool have been put out of the operator's reach by the addition of two pieces of plastic cut to shape and bolted to a strip of metal held to the tool body. Easily cut to any shape with even a coping saw, plastic sheet can be used similarly elsewhere for guarding of pinch points when see-through is needed in work. COST: About \$5.



◀ This stitcher has been made safer by the addition of a clear plastic guard. Constructed of 1/4-in. molded plexiglas and held in place by steel straps bolted to the upper arm of the machine, the device in no way impairs the speed of the stitching operation. By reducing access to the stitching head to less than 1/4-in., it removes the danger of stray fingers following into the head of stitcher. COST: \$4.



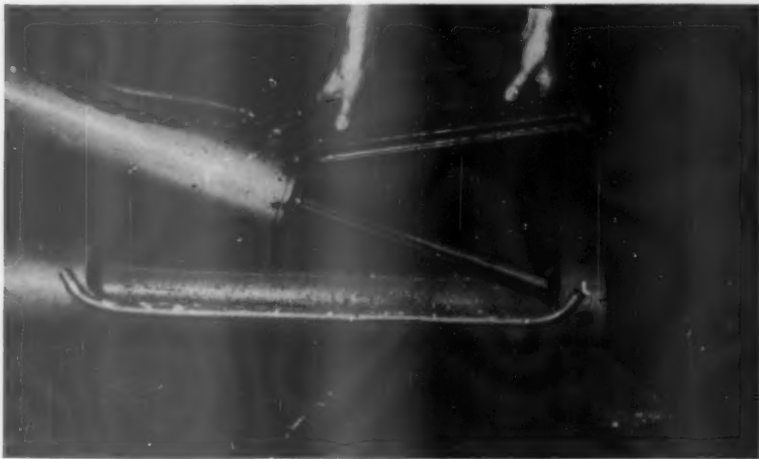
Than You Think

THESE PAGES offer more examples of inexpensive but efficient guarding devices shown during the Power Press and Forging Section's annual "Cheaper Than You Think" session at the 1960 National Safety Congress.

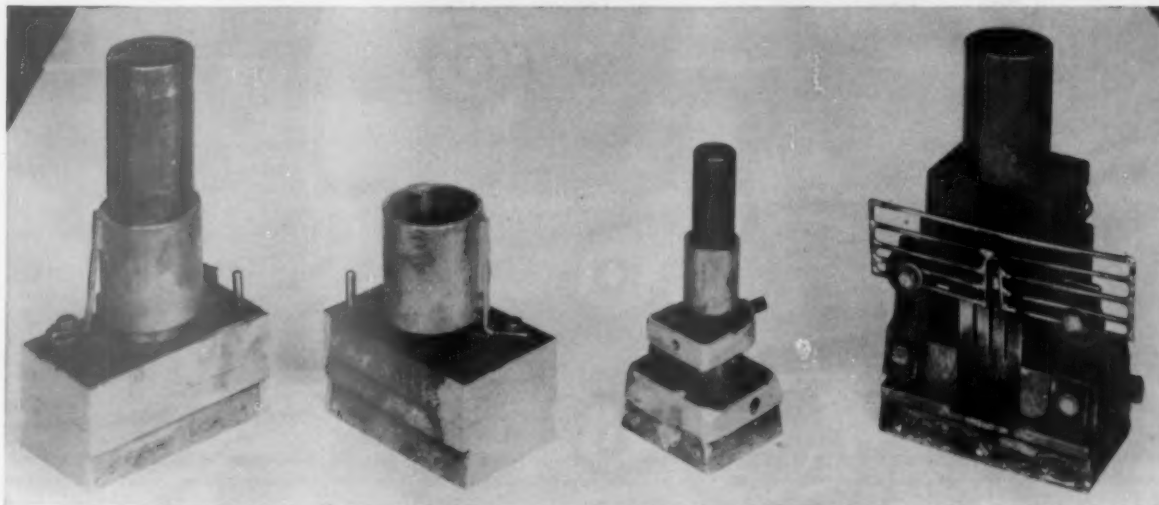
As indicated in an earlier publication of ideas from this session

(NSNews, December 1960), these safety guards are not presented as makeshift or short-cut measures, but as illustrations that common sense and ingenuity can devise positive guarding for certain circumstances without major expense.

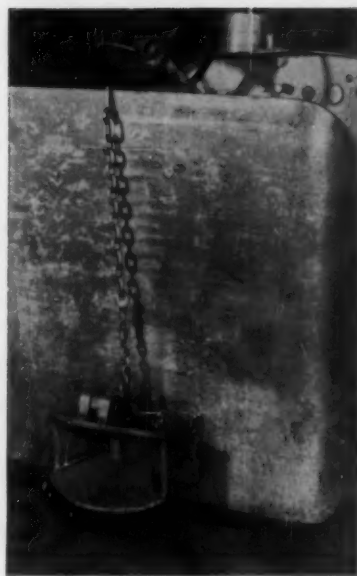
The installations here cost their makers \$4 to \$50, averaging \$12.



▲ In one shop where hydraulic outriggers are used for lifting and sustaining loads, positive protection was sought against possible hydraulic failure. The solution was the safety block pictured. A chain keeps the block handy for quick insertion, when needed to keep loads aloft. COST: \$10.



▼ Illustrated are guards for small flattening dies. The three guards at left are simply sections of pipe long enough to contain the punch and mounted to allow only 1/4-in. entry. At right the piece is fed through the slotted opening of a metal guard. COST: About \$5 to \$10 per die.

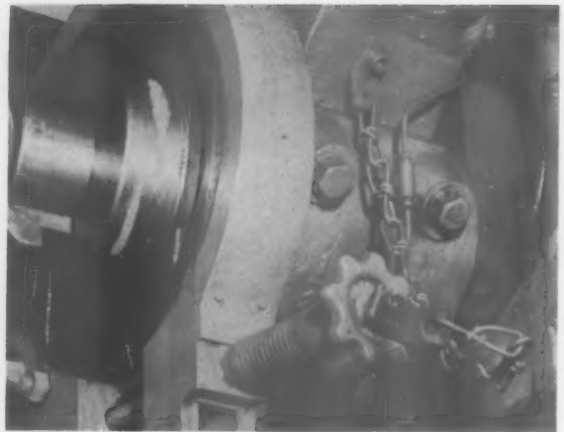


▲ To eliminate manual uncoupling and its hazards, this truck was fitted with a drawbar device operated by the operator from his seat. The enlarged female section facilitates coupling. The trailer drawbar — not shown — is a simple conventional eye hook. COST: \$50.

Cheaper Than You Think



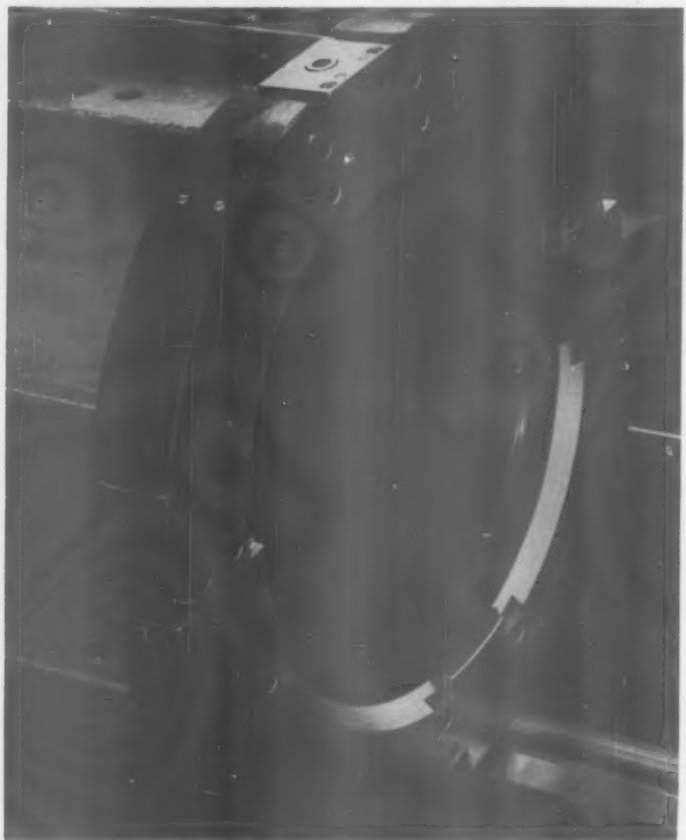
▲ Sparks from this spot-welding operation were a hazard to the operator before a capped, slotted pipe length was added. Air forced through the slot under 25 lbs. pressure forms an air curtain to deflect the sparks that might fall on and burn machine operator. COST: \$25.



▲ Screw adjustment tension bolts on power presses may possibly fail and become projectiles. A positive method of keeping them harmless in such cases is to tie them down like popgun corks. A chain forms the tether which effectively holds the bolts. COST: About \$4 per installation.



▲ Wherever the operator of this plate-bending roll might encounter trouble, flexing his knee will shut down the machine. The knee bar acts on special cut-out switches. COST: About \$20 and 15 hours of labor.



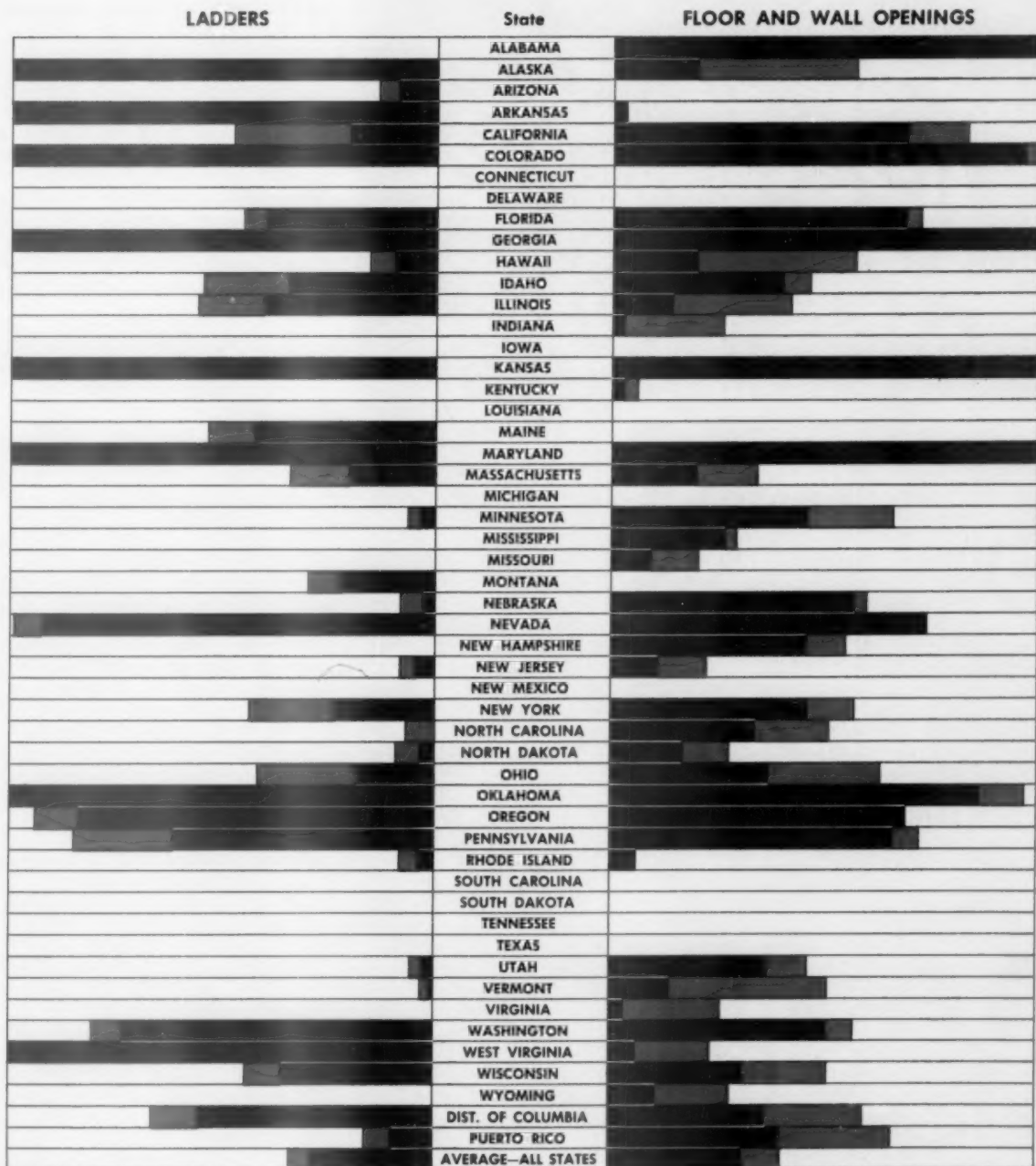
▲ The holding and adjustment jaws of this lathe turning fixture formerly extended beyond the circumference of the fixture, creating a hazard. Filler blocks of toolmaker's masonite were formed and attached between the jaws, providing protection to the operator by forming a uniform circumference. COST: Scrap material and 8 hours of labor.

ASA Codes and State Laws

A NEW GOVERNMENT study compares, provision by provision, existing state safety regulations with the American Standards Association safety codes.

The comparisons, in chart form, are being published by the Division of Safety, Bureau of Labor Standards, U.S. Department of Labor.

Among the first to be published are the two charts simplified below. "Ladders" is ASA A10.2, 1944, Part 10. The ASA code on floor and wall openings is to be found in A12, 1932. Percentage of provisions adhered to or neglected by the state is shown graphically.



Similar or more restrictive than ASA Standards
 Less restrictive than ASA Standards
 No code or standard

Industry Using More Seat Belts



Panhandle Eastern Pipe Line Co. equipped all company vehicles with seat belts. Employees were given a chance to buy belts for personal cars at a low price. (Panhandle Eastern Pipe Line photo)

Survey of NSC members shows industrial truck and fleet owners are using safety belts, but there is still room for improvement

NATIONAL SAFETY COUNCIL members operating vehicle fleets report increased use and acceptance of seat belts, but indicate need for greater emphasis on seat belt programming among fleet operators and drivers.

Analysis of completed questionnaires returned in a survey of NSC member-operators of vehicle fleets offer these conclusions:

1. Continued education is necessary to convince drivers on the values of using seat belts.

2. Fleet operators should be shown the advantages of safety belts even in low-speed urban travel.

ANALYSIS OF SEAT BELT USE BY SECTION

SECTION	Number of Respondts.	FLEETS				VEHICLES			
		PASSENGER CARS		TRUCKS		PASSENGER CARS		TRUCKS	
		Fleets Reported	Number With Belts	Fleets Reported	Number With Belts	TOTAL	With Belts	Per Cent With Belts	Total Reported
Aerospace	25	24	8	24	5	447	170	38.0	483
Air Transport	8	5	1	8	1	130	6	4.6	1235
Automotive & Mach. Shop	98	88	37	76	8	9804	3491	35.6	2113
Chemical	100	92	37	81	9	5550	2726	49.0	3828
Coal Mining	7	7	4	5	1	323	214	75.0	430
Construction	56	54	19	52	7	1128	236	20.9	4224
Electrical Equipment	64	58	18	55	3	835	64	7.7	695
Food & Beverage	121	98	35	114	4	7226	2135	29.5	11202
Fertilizer	26	21	6	23	1	688	202	29.3	198
Marine	34	32	2	27	1	295	6	2.0	290
Meat Packing, etc.	27	22	3	25	1	4644	1726	37.2	4270
Metals	151	131	43	125	6	5160	3815	74.0	4123
Mining (Noncoal)	65	55	22	58	9	1064	731	68.6	1932
Petroleum	69	68	38	65	15	14847	5942	40.0	13814
Power Press & Forging	30	22	5	26	1	2489	483	19.4	562
Printing & Publishing	20	16	2	17	0	95	23	24.2	86
Public Employee	32	31	10	30	4	3138	1174	37.5	6703
Rail & Paper	186	162	70	145	9	3036	1902	62.7	1954
Railroad	42	38	6	40	1	1191	168	14.1	4808
Wholesale, Retail, & Hotel	11	11	5	10	1	130	28	21.5	1502
Wood Products	59	53	25	56	5	753	249	33.0	3980
Motor Transport	207	191	112	176	41	22183	11257	50.8	30430
Totals	1438	1279	508	1208	133	85156	36748	43.2	98865

3. Programs might effectively stress the economic savings to firms through reduction of injuries and fatalities.

4. Cost of seat belts is not an important consideration with managements that haven't equipped their fleets with belts.

This industry-wide inquiry developed from a program to stimulate use of vehicle seat belts. Jointly sponsoring this probe were NSC, the U.S. Public Health Service, and the American Medical Association.

Members of the Council's Industrial, Traffic, and Motor Vehicle Departments designed survey forms to sample the extent of safety belt usage and to secure general information on use of safety belts as a preliminary step in planning a national educational program in this field.

Of 10,000 survey forms mailed to Council members, 1,438 completed questionnaires returned. This represents a response of about 14 per cent.

Representing 22 industrial sections, the survey reflects safety belt installations in 1,279 passenger car fleets (85,156 vehicles) and 1,238 truck fleets (98,862 vehicles, including a negligible number of transit vehicles).

In most cases, safety supervisors and directors completed the forms, which have been tabulated and analyzed by the Council's Traffic Operations Division.

Of 1,438 respondents, 513 indicated some or all of their passenger cars and/or commercial vehicles were equipped with belts.

Of 1,279 passenger car fleets reporting, 508 (40 per cent) indicated some or all of the vehicles have been equipped with belts. About 133 (10.8 per cent) of the 1,238 truck fleets used belts.

Low-speed, multi-stop urban type of operation was given as the reason for not using safety belts by 29.7 per cent of survey participants whose fleets were not belt-equipped.

Safety men representing 15.2 per cent of firms whose fleets didn't use belts attributed nonuse to lack of management's belief in the value of safety belts.

General indifference, lack of interest, and apathy were blamed by 12 per cent of those reporting as

REASONS FOR NONEQUIPPED VEHICLES

Reasons	Responses	Per cent of Total
Low Speed, Multistop Urban Operation	74	20.0
Not Convinced of Value	38	10.3
General Indifference, Apathy	30	8.1
Unable to Enforce Use	17	4.6
Cost	13	3.5
Low Accident Rate in Past	12	3.2
Other	123	33.2
No Answer	63	17.1
	370	100.0

DRIVER ACCEPTANCE METHODS

Method	Responses	Per cent of Total
General Education Program	105	24.3
No Problem — Belts Requested by Drivers	45	10.4
Use of Belts Required by Company	27	5.5
Accidents Involving Company or Other Drivers Which Demonstrated Value of Belts	21	4.7
Personal Contact	15	3.5
Use of Films	4	0.9
Other	42	9.7
No Program	173	40.0
	432	100.0

DRIVER USE OF BELTS — URBAN DRIVING

Drivers Use Belts:	Responses	Per cent of Total
Always	131	33.3
Sometimes	126	32.0
Seldom	89	22.6
No Answer	48	12.1
	394	100.0

DRIVER USE OF BELTS — RURAL DRIVING

Drivers Use Belts:	Responses	Per cent of Total
Always	245	62.0
Sometimes	79	20.0
Seldom	25	6.3
No Answer	47	11.7
	396	100.0

the principal cause for nonuse of seat belts in their fleets.

Where responses indicated partial or universal use of safety belts by an organization, 40.4 per cent of respondents traced the use to an effective general education program; 16.8 per cent to drivers' confidence in the value of belts; and 10.4 per cent to the memory of previous driver injuries, the driver's personal experiences, or contact with other drivers whose experiences indicated belt use.

Larger fleets tended more toward use of safety belts than the smaller

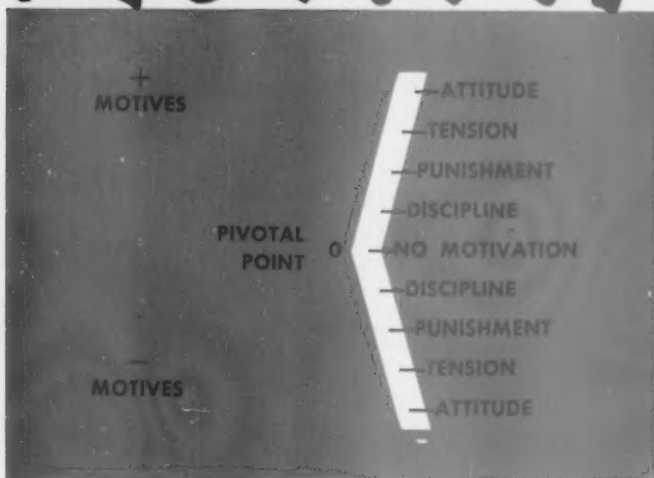
fleets. The average number of passenger cars in fleets totally or partially equipped with belts was 134, in contrast to an average of 21 cars per unequipped fleet. The average number of trucks in totally or partially equipped fleets was 209, with a 64-vehicle average in unequipped fleets.

Incidentally, material gathered by Council departments showed an increasing number of fleet operators who have seen the value of seat belts are urging installations of this safety device in private vehicles through off-the-job campaigns.

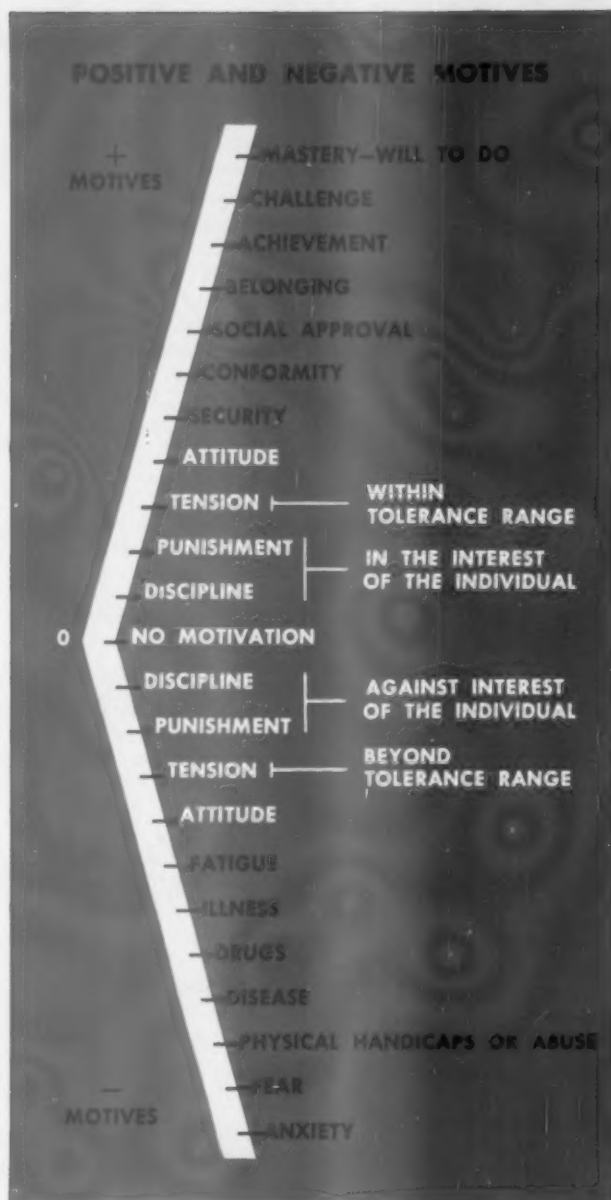


A new persuasion concept that might be called "incentivation"

MOTIVATION—



the art of



WITH THE PLUMAGE of high-sounding description stripped away, motivation reveals itself as simply "the art of letting people have it your way."

In an age when we are up to our ears in motivation — product motivation to buy cereals, soaps, compact automobiles, and to actively support national and local movements of all kinds — folks are justified in being skeptical and at times obstinate if they suspect they are being motivated against their own will and interests. And all the recent talk of subliminal motivation tends to make people even more skeptical and suspicious.

Before we go into the story of how motivation works, let's clarify what we mean by motivation — what it is and what it is not. We can then talk about how to motivate people successfully, and complete our discussion with the methods of checking to see if motivation is working.

Bear in mind that what we shall talk about is fundamental to and true of all motivation, even though our applications of it and our illustrations will be in the field of safety.

What We Mean by Motivation. Current misconceptions and fallacies must be cleared up before settling on basic definitions.

Some things that motivation is not: It is not some subtle potion brewed of words, ideas, hypnosis, and thought control that enables us

letting people have it your way!

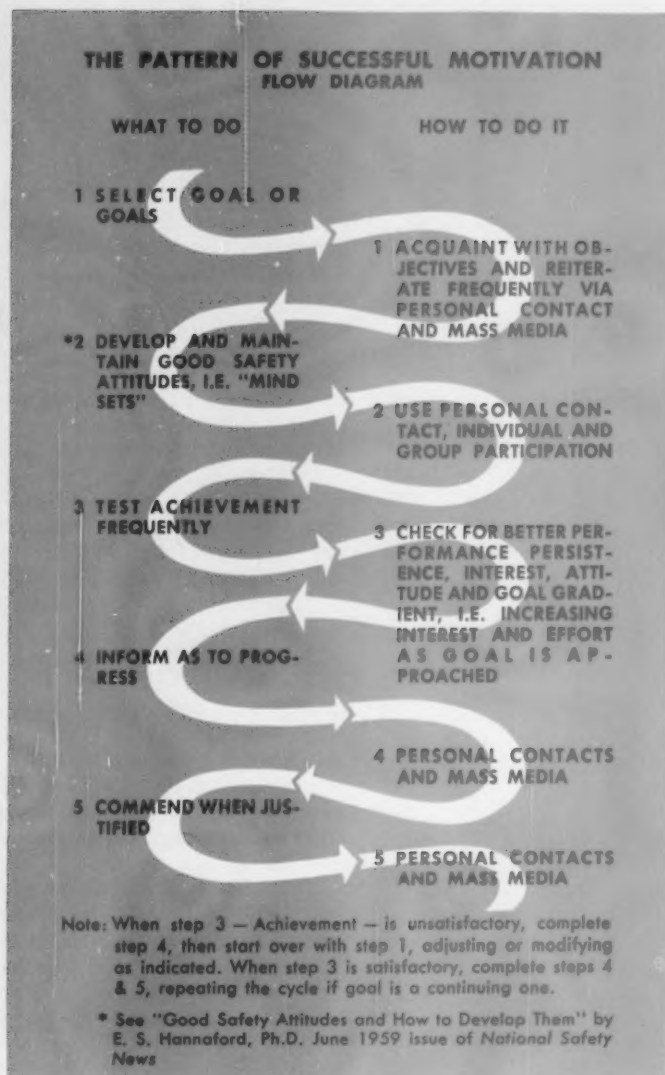
By **EARLE S. HANNAFORD, Ph.D.**

Safety Engineer, Long Lines Dept.,
American Telephone and Telegraph Co.

to manipulate people to our own advantage against their will.

Motivation is not based on disabling or eliminating our freedom to think for ourselves, but using it. It does not violate the right to make up our own minds and to choose for ourselves.

It is true that perversion and dis-



not use the negative controls of fear and anxiety. This is based on one of the key axioms of learning, and motivation is directed learning.

Dr. Lester Sontag states it this way: "The basis of all learning (positive motivation) is the striving by the individual to lessen anxiety by mastering problems as they arise." We shall use this principle later.

We can now define motivation with confidence that it will not be misinterpreted. I am going to use what I like to call a "sequential form of definition"; first defining motivation, then defining the key words used.

1. Motivation is supplying the incentives which impel an individual to achieve a pre-selected goal.

2. An incentive is anything which an individual feels will satisfy a drive or a motive.

3. A drive is a persistent stimulated condition, usually rising from body-tissue needs and demanding immediate satisfaction.

4. A motive is any condition, usually emotional, that arouses, sustains, and directs an individual's activity to a preselected goal.

Motivating people for safety centers primarily about providing incentives which satisfy a motive, since safety is not a "one shot" thing, but calls for sustained, persistent, directed activity on a continuing day-after-day basis. Also, it has a high emotional content.

Drives, Motives and Incentives.
Before making more conclusions or

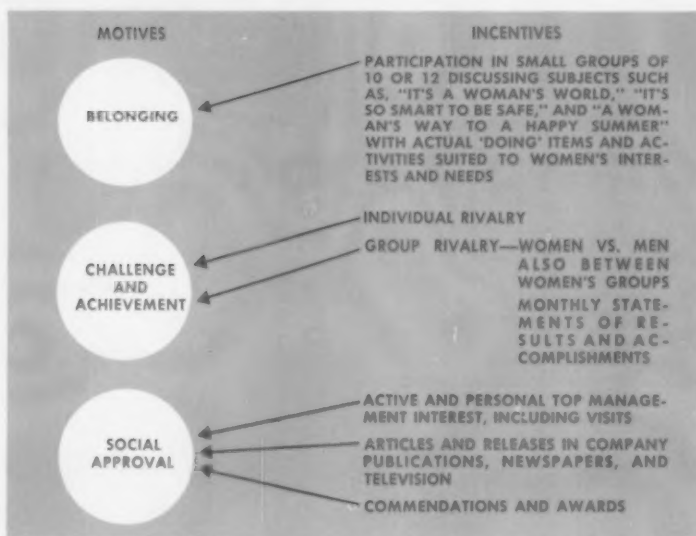
— To page 117

tortion of motivation has given birth to the maniacal, ruthless devil's brood of propaganda, thought control, and brain washing. All these reduce man to a mere automaton or robot — a slave of the will, spirit, and emotions of another.

In safety, as in all motivation for sane, rewarding living, we seek to motivate for the good of those motivated. This calls for arousing voluntary persistence and perseverance.

Positive motivation operates without using negative controls of fear and anxiety. It does not destroy the individual's perceptive and ethical values, nor does it seek to produce negative motivation through depression of physical, mental, or emotional responses and reactions.

We said positive motivation does





Paterson Plant Prints Safety Primer

**Safety training is no joke,
but humor can help**



Lift Truck Operation

- Check each day the safety devices (horn, brakes, etc.) on your vehicle before starting work. Report any faulty operation to Section Supervisor and Section Safety Man.
- Sound horn and watch carefully for pedestrians and other truck traffic at all aiseways, corners, exits, entrances, etc.

**THE PEDESTRIAN HAS
THE RIGHT OF WAY**

- Always drive at a safe speed. Approach corners or aiseways at a reduced speed. Pace your direction of travel whenever possible.
- Do not travel with forks of loads raised more than 4-6 inches above floor level. Always lift, lower, or carry a load with the upright vertical or slightly tilted toward the rear. Never lift or lower a load while the truck is in motion.



Safety Procedure

When a matter arises which relates to the safety of an individual, or individuals, or indicates an unsafe condition in a section, the following procedure is to be followed:

1. Bring matter to the attention of the Section Safety Man who will discuss it with the Section Supervisor.
2. If matter cannot be resolved, it will be carried immediately to the Department Safety Man and General Foreman.
3. If further action is necessary, the matter shall be brought to the Assistant Plant Manager to be resolved.

TO CONDENSE basic safety ideas into an easy-to-carry, easy-to-read, easy-to-understand booklet for distribution to employees, one Continental Can Company operation keys its messages to sly, humorous illustrations.

The result is a 28-page, 4- by 6-in. handbook of safety facts geared to the worker. Covered in layman's English are subjects ranging from the plant's internal safety organization to principal facets of materials handling, forklift operations, machine guarding, housekeeping, fire safety and protection activities, and off-job safety.

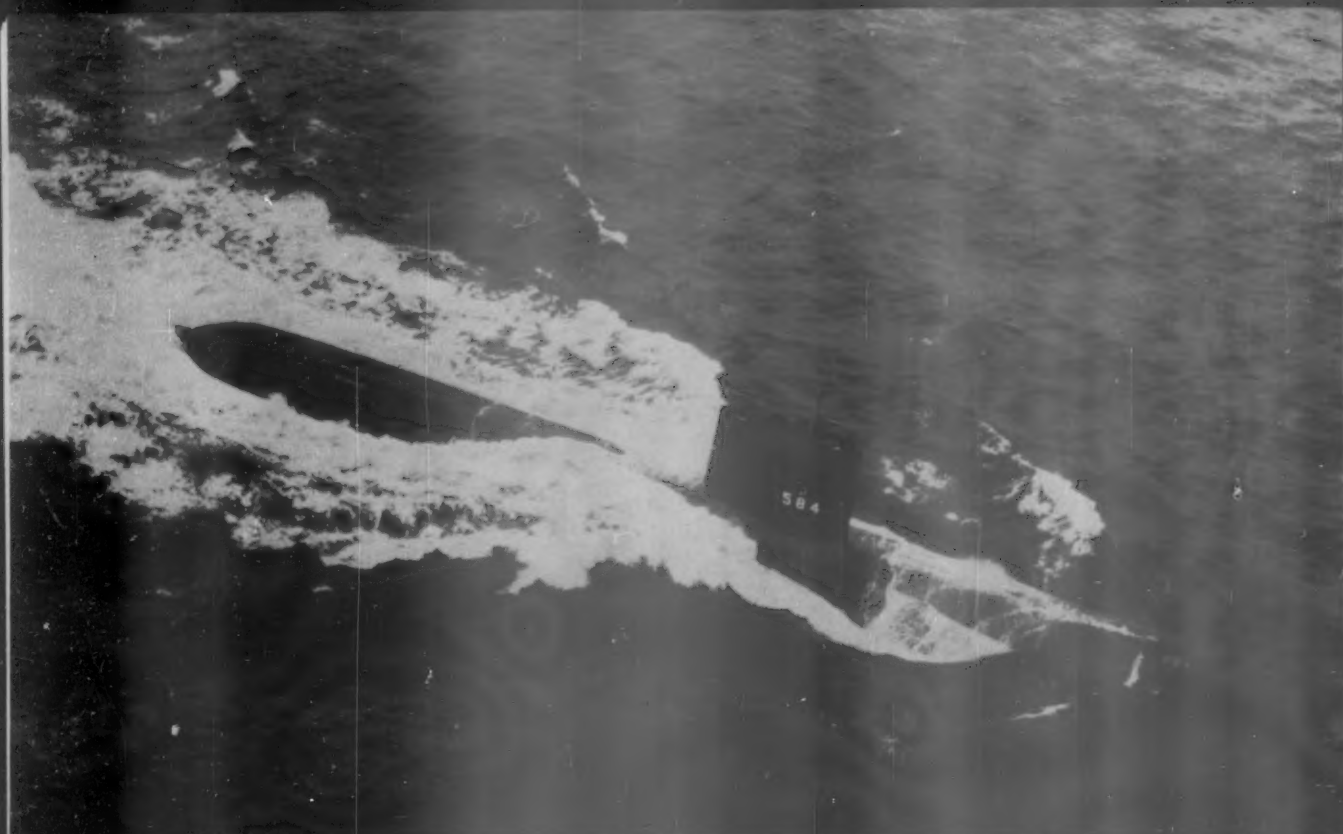
The booklet was produced at Plant No. 48, managed by G. A.

Painter, who headed a committee that commissioned artwork and design and wrote the handbook's text.

The drawing above is from the handbook's cover and shows more unsafe practices than you can blink an unguarded eye at. Inside the publication's cover (left) are explanations of ways to correct these practices. Typical of other illustrations is one (below) promoting the idea of dedicated accident-prevention efforts by the sectional safety man in industry.

Single copies of this booklet are available to interested safety men from Continental Can Company through NATIONAL SAFETY NEWS, 425 N. Michigan, Chicago.





THEY SAIL UNDER THE ICE,

Before its under-the-ice voyage, the SS (N) Seadragon was equipped to cope with fire emergencies (Photo courtesy Mine Safety Appliances Co.)

I REALIZED we would have to devote more attention to fire hazards . . . we would have to have some kind of a special breathing apparatus to protect the crew in case of fire . . . while we were submerged under the pack."

These are the words of Commander William R. Anderson, U.S.N., skipper of the SS (N) Nautilus when that atomic-powered submarine made its historic voyage from the Pacific to the Atlantic Ocean beneath the Arctic ice.

In his account of the first polar trip, Commander Anderson said "fire was the greatest potential danger under the ice pack." If fire had occurred, "we could not have surfaced and the Nautilus would have been lost."

The need for special breathing devices actually did occur, but when the sub was enroute from Panama to San Francisco and not under ice in the spring of 1958 — just a few months prior to its pioneer voyage. Emer-

gency smokeproof breathing apparatus was installed. Since then, similar equipment has been placed aboard all other U.S. nuclear subs, including the SS (N) Seadragon — which recently completed an Atlantic-Pacific polar crossing.

Cause of the Nautilus fire was oil-soaked insulation around the sub's port high-pressure turbine. High-speed running in warm, tropical waters apparently caused the blaze and resulting smoke which Lt. William G. Lalor, Jr., main propulsion officer, described as "acrid." The Nautilus was able to surface to rid itself of the fire and smoke.

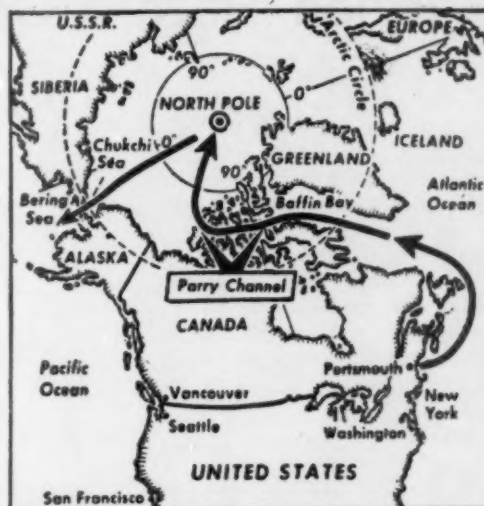
This experience revealed the urgent necessity of installing emergency breathing equipment aboard subs involved in polar voyages.

Based on the emergency Nautilus installation, placement of special apparatus on the Seadragon, commissioned late in 1959, is typical of that employed aboard other ships in the U.S. atomic sub fleet.



Emergency drills are regular part of submarine living. Breathing masks like the one worn by this control area crewman were used 15 times on one cruise.

More than once on its trip from the Atlantic to the Pacific via the North Pole, the SS (N) SeadrAGON was under arctic ice, making surfacing impossible.



BUT

THEY BREATHE EASY

There's an old saying that there is nothing more terrifying than
a fire at sea, but sub men ask, "How about a fire under the sea?"

Although the sub is designed for about 85 men to live comfortably while totally submerged for long periods of time, it is equipped with 155 air line respirators — packaged in synthetic leather and stored in various areas for immediate use under all possible conditions.

The light weight respirator's design is particularly suitable for use where protection for the face and eyes is a necessity. The speaking diaphragm facepiece provides an airtight seal through use of adjustable headstraps.

Each of the respirators is equipped with either a 10- or 25-ft. long hose that connects an all-vision facepiece with a demand regulator featuring a quick disconnect coupling. This permits the wearer to plug into any of 50 four-outlet manifolds, piped off the sub's low pressure air system. The system originates from a number

3000-pound pressurized tanks — used for surfacing and torpedo firing — and is reduced to 100 pounds pressure before passing through a line filter. This removes organic vapors and particulate matter.

To determine positioning of the respirators, LCDR George P. Steele, captain, and LCDR Lalor (the main propulsion officer on the Nautilus), engineering officer, and others considered sleeping, eating-recreation, watch, and battle stations. Generally, most activity centers around the crew's messroom — largest open area aboard — and 53 of the respirators are stored in this area. Others are lockered in the control center, engine room, forward torpedo room, stern room, wardroom, and sonar, electronic equipment, radar, radio, and reactor areas. "We wanted them where they

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IDEAS THAT WORKED

Devices and Ideas to Help
Your Safety Program

By ARTHUR S. KELLY, Industrial Department, NSC

Cartoon-Hazard Contest

Highlights Posted Precautions

TO ACQUAINT workers with the location and contents of job safety practice write-up sheets posted on equipment, Olin Mathieson Chemical Corporation's Western Brass Mills Division conducts contests based on cartooned hazards in its East Alton, Ill., plant.

Prizewinners have to correctly identify the most hazards shown on the cartoons and then list the greatest number of appropriate job safety precautions pertaining to these hazards.

Winners of contests involving this cartoon approach receive either 35-cup automatic coffeemakers (for first prize) or pen and pencil sets with the green cross for safety emblem (for second and third placers).

Write-up sheets represent the results of job safety analyses of the firm's equipment. Copies of the cartoons for each contest serve as entry blanks and are distributed to workers the same day the job safety write-up sheets are posted.

The cartoon at right is for the first competition, in which 15 per cent of eligible workers took part. The second contest netted 13 per cent participation.

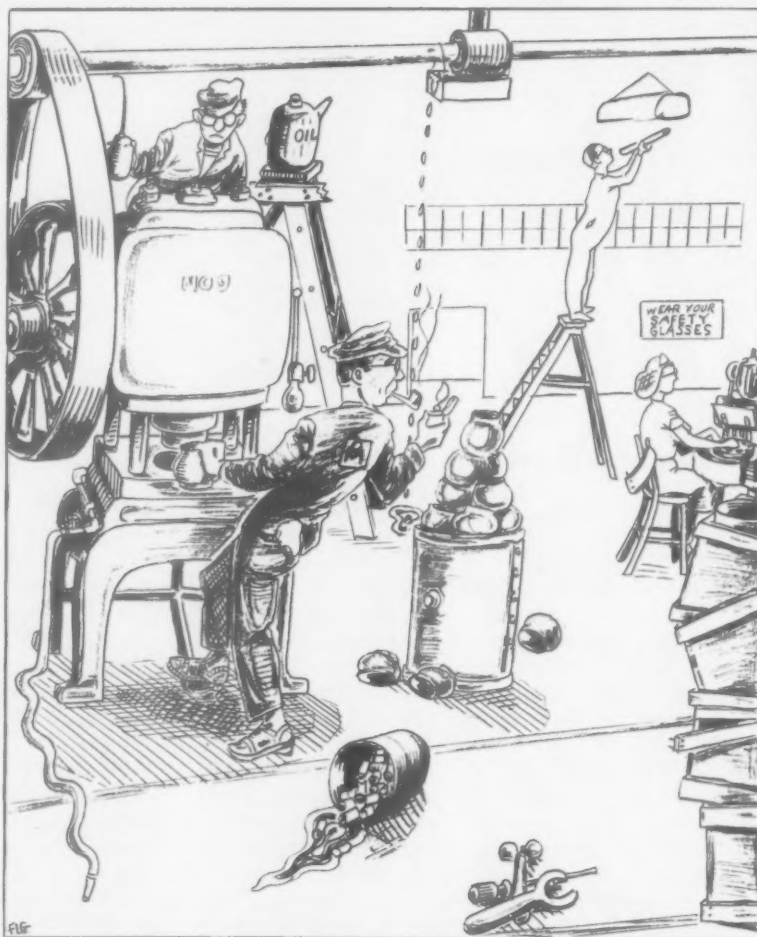
All employees except supervisors of fabricating and cupping departments are eligible . . . including employees in tool development and repairs, tool stores, finishing, packing and inspection departments.

Hazards in the cartoons and the precautions applying to them must be listed on the reverse side of the cartoon-entry blank.

One hint offered by management: referral to the *General Plant Rules* and *Job Safety Practice* write-up sheets available on the premises.

"SPOT the SAFETY HAZARDS"

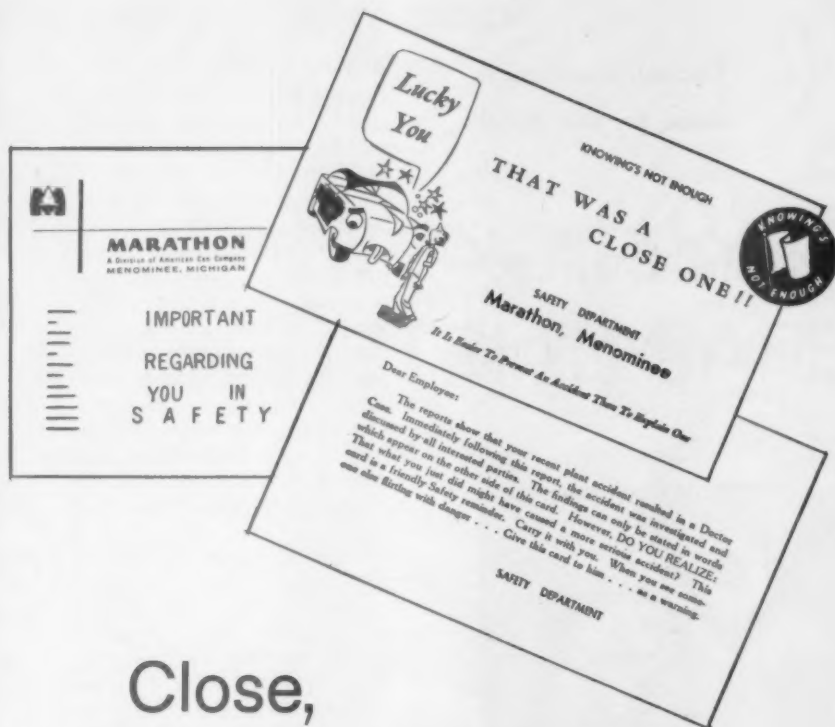
CONTEST NO. 1



Submitted by:

Name: _____

Clock No.: _____



Close, But Not Forgotten

WHENEVER an employee has an injury severe enough to require the attention of a physician but not serious enough to be considered a disabling injury, this card is sent to the hurt worker's home.

In addition, Edward C. Christensen of Marathon, a Division of American Can Company in Menasha, Wis., also sends the person concerned a little button.

Shown here on the upper right edge of the card, the button carries the yellow flag and

the words, "Knowing's Not Enough." The injured person can wear this button as a reminder of his close call and as a commitment from himself that safety will be on his daily list.

This method of distribution has an added value: the wife, husband, or parents of an injured employee are made aware of the mishap and can add their own pleas for the careless worker to be more responsible in preventing on-job and off-job injuries.

JANUARY WINNER

January prize winner was "Clipping-Posters." Newspaper clippings were made into safety posters, emphasizing particular industrial hazards. Company regulations also were tied in. This idea was submitted by R. A. Koy of the United States Gypsum Co., New Orleans, La.

SIX-MONTH WINNER

C. W. Talbot of Industrial Generating Company, Rockdale, Tex., wins for "Accident Marker," which lowered firm's frequency rate 70 per cent in two years. Mobile sign, placed on sites of mishaps, has mirror and message: "Our last accident occurred here. Are you next?"

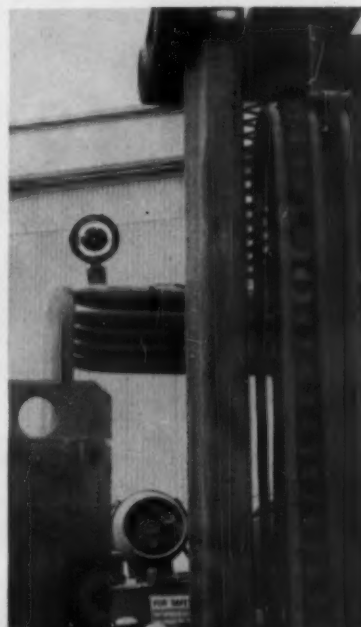
A Light That Won't Fail

TO ATTRACT the attention of pedestrians in industrial activities, a flashing red light has been installed on the overhead guard of a fork lift truck at United States Gypsum Company, New Orleans, La.

The beam of the light is focused on the floor 15 to 20 ft. ahead of the machine's forks. This light is not intended to give the equipment a distinct right of way but is meant to warn walkers in the aisle that a truck is approaching them from behind.

Realizing this problem can be handled through audible, visual or a combination of methods, this flashing light is suggested as the most reasonable solution.

Although one color might in time become too common, and lose its meaning and impact, R. A. Koy, of this firm and submitter of this idea, feels the universal acceptance of red as the color to designate hazards makes it the most desirable warning for workers in industrial environments.



Council Instruction Goes on the Road

NSC Fundamentals Course Taught in Pennsylvania



The nature of electrical hazards is pointed out to students by D. D. Mateer, Jones and Laughlin Steel Corp., one of 13 instructors who taught the "Fundamentals of Industrial Safety" course.

Reviewing the basics of industrial safety during the course were (standing) Earl Stephan, Western Pennsylvania Safety Council; James L. Mercer, assistant works safety administrator, Jones and Laughlin Steel Corp.; Edmund W. Dransen, personnel director, Copperweld Steel Co.; Charles H. Roberts, director, safety and plant protection, Pittsburgh Plate Glass Co.; James R. Weese, safety director, Koppers Co. Inc.; Joseph Toskin, safety inspector, Sharon Steel Corp.; J. J. Nolan, safety engineer, Bethlehem Steel Co. (instructor); William Mitchell, safety director, Federal Enameling and Stamping Co.; Paul A. Takach, safety inspector, Allegheny Ludlum Steel Corp.; John M. Horter, operating supervisor, Duquesne Light Co.; J. W. Tysse, manager of safety, Republic Steel Corp. (instructor); and L. C. Smith, NSC. Seated are A. S. E. Kinsey, assistant safety supervisor, Union Railroad Co.; Robert R. Esler, director of industrial relations, Pittsburgh Plate Glass Co.; Andrew Oresick, industrial relations department, Pittsburgh Plate Glass Co.; R. F. Willett, director of safety, Jessop Steel Co.; Elmer Rugh, safety director, John F. Casey Co.; James L. Williams, field agent, Carnegie Natural Gas Company; and D. D. Mateer (instructor).



EXPANDING its training program, the National Safety Council marked up another *first* recently by conducting the "Fundamentals of Industrial Safety" course away from Chicago headquarters. Co-sponsoring the course in Pittsburgh, Pa., were NSC's Metals Section Training and Education Committee and the Western Pennsylvania Safety Council.

Instructors came from the Pittsburgh area. Training sessions were similar to those offered five times annually at Council offices in Chicago. Plans are under way to step up training of safety men through similar courses in other areas in the country.

J. W. Tysse, manager of safety, Republic Steel Corp., Cleveland, Ohio, chairman of the NSC Metals Section Training and Education Committee, recruited instructors for the course. The Western Pennsylvania Safety Council handled promotion, enrollments, and local arrangements.

L. C. Smith, director of industrial training for NSC, coordinated the program.

Instructors were: W. H. Baumann, industrial hygiene engineer, Jones and Laughlin Steel Corp., Pittsburgh; W. R. Gilliland, assistant safety director, Aluminum Company of America, Pittsburgh; M. W. Gray, safety director, Wierton Steel Co., Wierton, W. Va.; J. D. Holtzapple, manager of safety, Blaw-Knox Co., Pittsburgh; D. D. Mateer, supervisor, safety and welfare department, Jones and Laughlin Steel Corp., Pittsburgh; W. T. McLean, general supervisor of safety, U.S. Steel Corp., Youngstown, Ohio;

J. J. Nolan, safety engineer, Bethlehem Steel Co., Bethlehem, Pa.; A. F. Romig, manager, training and safety, Allegheny Ludlum Steel Corp., Pittsburgh; W. P. Saunders, safety director, Universal-Cyclops Steel Corp., Bridgeville, Pa.; E. L. Speck, supervisor of plant fire protection, Jones and Laughlin Steel Corp., Pittsburgh; J. L. Sumpter, general supervisor of safety, U.S. Steel Corp., Clairton Works, Clairton, Pa.; C. P. Vorhes, coordinator of safety, Jones and Laughlin Steel Corp., Pittsburgh; and J. W. Tysse.

PHOTOGRAPHY FOR THE INDUSTRIAL SAFETY MAN

*Copies of this data sheet will be
available for order within 30 days*

Introduction

1. In many ways, photography can be a valuable tool in industrial accident prevention work. The purpose of this data sheet is to serve as an introduction to the subject. It discusses various uses of photography in industrial safety work, types of photographic equipment, and basic points of technique.

Safety Procedures

2. No safety engineer wants to have a professional photographer go into the plant to take safety pictures and cause accidents in the process. For this reason, as well as others, the work of a professional photographer should be supervised by the safety engineer, who should accompany him, brief him on the plant safety rules, and prevent him from endangering himself, his subjects, and other personnel in the effort to get pictures.

3. Likewise, when the safety man turns photographer (Figure 1), he wants to avoid sustaining injury himself or causing injury to others or damage to property. The basic safety principles provide a good guide. Photography, however, can involve some peculiar hazards against which the safety man-photographer should be on guard.

4. Even a safety engineer may become so engrossed in getting the picture that he becomes oblivious to safety regulations and principles. Therefore, either someone from the

This data sheet is one of a series published by the National Safety Council, reflecting experience from many sources. Not every acceptable safety procedure in the field is necessarily included. This data sheet should not be confused with American Standard Safety codes, federal laws, insurance requirements, state laws, rules and regulations, or municipal ordinances.

safety department or a plant employee should be pressed into service to act as an assistant — to keep the safety man-photographer from backing into a machine or off a roof. He can also prevent passers-

by from walking into equipment, leaving the safety man free to concentrate on taking pictures. If no assistant is available, the safety man will have to take special care to work safely throughout the operation.

5. People are interested and distracted when photographs are being taken near their work places. Therefore, every effort should be made to see that bystanders are not distracted to the point of forgetting themselves and possibly getting injured on machines or in other ways. To prevent people working nearby from being startled, they should be warned before flashbulbs are used.



Figure 1. The safety man as photographer.



Figure 2. A picture that reveals an unguarded belt, other exposed moving parts, and a spill on the floor. (Courtesy Transit Casualty Co.)

6. Extension cords for floodlights and other equipment should be in good condition . . . free of breaks, makeshift splices, worn spots, and broken plugs. In use, cords should be strung out of the way as much as possible. Excess cord should be neatly coiled and placed where no one can become entangled in it. Not only is wire looped around on the floor a tripping hazard, but a passer-by catching his feet in it can bring valuable equipment crashing to ruin. Spent flashbulbs, film pack tabs, and other items to be discarded should be placed in trash cans.

7. The photographer should use caution in climbing to a high place to get a good angle. If he must climb a ladder, the camera and other equipment should go up on a hand line after he has reached his perch. At all times, he should make sure that footing is secure, not only for himself, but also for his tripod, camera, and other equipment. If something goes wrong and a fall threatens, he should save himself and let the camera go. This rule may be contrary to the professional cameraman's philosophy, but it is consistent with the safety engineer's.

8. It is a good precaution to examine flashbulbs for cracks. Cracked bulbs should be discarded because cracks will let in air and the bulbs will explode. Flashbulbs should be used only in shielded reflectors for they explode occasionally and can—if unshielded—

shower hot glass fragments several feet around. For most purposes, a clear plastic hood over the flashbulb in its holder offers sufficient protection.

9. Other sensible precautions are for the photographer to wear a glove when he inserts flashbulbs in sockets, and to aim the flashholder away from his face while doing so. A bulb may flash as it is inserted, and severe hand burns can result. It may also break, causing cuts. Spent bulbs, too, may break or may still be hot. Used flashbulbs should be removed by operating the bulb ejector (with which most flashholders are equipped). They should be ejected into a suitable trash container. A freshly fired bulb should never be allowed to come in contact with new bulbs—it may ignite them.

10. Neither flashbulbs nor extension floodlights should be used in the presence of flammable vapors or dusts. Explosion-proof, Class D or equivalent equipment, including lights, sockets, and switches, is permissible under such conditions. Where the use of flashbulbs or floodlights could be hazardous, use of modern high-speed film as a substitute to obtain similar results is a definite safety measure.

11. All electrical equipment (except battery-powered flash equipment) should be grounded, preferably by means of UL-listed three-wire cords and three-pronged receptacles.

Uses of Photography in Industrial Safety

12. Pictures can be instructive. Just one picture can often explain as much as a whole page of text. For example, it is difficult to describe a knot in a rope, but a picture showing how the knot is made can easily be understood.

13. Reports or recommendations to management can often profitably be supplemented by photographs which clearly show the need for correction of conditions or for other action (Figure 2). Such photographs, in fact, sometimes serve as highly effective persuaders.

14. Pictures, especially those which tell a story well or make a point or convey an idea clearly (Figure 3), arouse interest. People like to see familiar scenes and faces—particularly their own faces—in pictures.

15. It is a fact to be noted that whenever employees on the job are involved in or witness the taking of photographs for safety purposes, their subsequent interest in safety is noticeably increased.

16. The effectiveness of a picture depends upon the skill of the photographer. Therefore, the safety man who sets out to use photography as a tool of his profession should develop his skill to a reasonable level, so that the product may accomplish the intended purpose.

17. Particular advantages result from the safety man's becoming a good photographer. Once he has combined camera competence with his knowledge of safety, he can produce effective pictures that do not



Figure 3. A picture that tells its own safety story . . . goggles splashed with molten metal. The wearer's eyesight was saved.

unintentionally show unsafe conditions and practices and he can go about making those pictures in an accident-free manner.

18. Publicity offers one of the most effective uses of photography in safety work. Skillful use of good pictures in print can help sell the safety program to management, the public, and, especially, the employees in an organization. In the small community particularly, pictures in the press of award presentations, safety meetings, workers with good safety records, and the like add to the good reputation of the company and help create public good will. Before release to publicity channels, all such pictures should be checked to make sure that they do not inadvertently show unsafe conditions or practices.

19. Interesting pictures presenting the positive aspects of safety are of great value in the company magazine or paper, which should feature safety at regular intervals. In the absence of an employee publication, many safety engineers have started one to promote safety and have found its success attributable in large measure to the use of good pictures. Many organizations have both a company magazine and a safety bulletin, for which good photographs are needed.



Figure 4. An attractive model posed for this photo to help promote a "wear your hard hat" campaign.



Figure 5. An unusual group photo. Members of a hotel safety committee sat for their picture in front of mannequins they prepared for an exhibit demonstrating various types of injuries. (Courtesy Hotel DuPont, Wilmington, Del.)

20. The picture story is an effective device for safety publicity. One of the larger railroads, for instance, ran a series of picture stories in its magazine over a period of a year. Each story was built on the title "A Safe Day in . . ." One, "A Safe Day in Freight Service," portrayed the safe workmanship of a conductor and his crew on a local freight train throughout the run and showed him returning safely to his family at the end of the trip. The series won for the magazine an Award of Merit for Exceptional Service in the Promotion of Safety, sponsored by the International Council of Industrial Editors and NSC.

21. As a subject for publicity, industrial safety suffers from a lack of glamour. A touch of feminine beauty here and there will do much to remedy this deficiency. Good pictures of pretty girls modeling safety clothing and equipment (Figure 4), holding posters, accepting or presenting awards will animate the solid, substantial message of accident prevention. This type of approach never loses its appeal. The bounds of good taste should, of course, be respected.

22. In group pictures, it is a good idea to pose the group compactly



Figure 6. A photograph used effectively in a poster. The accident was re-created. That the picture shows the "wrong way" of storing a hand truck is clear, because the consequences are apparent.

and yet informally rather than to use the stereotyped line-up (Figure 5). Pictures of award presentations follow a pattern hard to break away from. Nevertheless, happy, natural expressions should be sought.

23. Accident scenes can provide material for posters (Figure 6) and



Figure 7. Picture display used to good advantage in driver safety education. (Courtesy Transit Casualty Co.)

various other displays. To secure a picture of an accident, the scene usually has to be re-created. Ordinarily, no photographer will be standing by with loaded camera in hand at the moment an accident occurs.

24. When an accident scene is being re-created, the photographer should take special care to protect himself and his subject from injury and safeguards should be employed to ensure that the accident will not be re-created literally. It should be understood that pictures re-creating accident scenes are of educational value only; they probably have no legal evidential standing.

25. The position of the victim can sometimes be indicated by chalk outlines. If a model is required, it may be desirable to use a member of the safety department staff so that there will be no need to ask one employee to duplicate the unsafe act of another.

26. When necessary for realism, the accident-causing agency can be suspended by rope or blocks, and the accident victim (model) can sit or stand on a stool or be propped in the "actual event" position. The props can then be air-brushed from or retouched on the print by an artist, depending upon the effect desired.

27. In many cases, photographs of an accident scene, with the victim removed but with everything else left undisturbed, not only will provide valuable object lessons but also will assist in the investigation of the accident. The photographs

should help to show what happened and why. Sometimes a single photograph will reveal clearly the cause and effect. In other cases, a series of pictures may be necessary, with close-up shots, for instance, of a part that failed, and with overall shots to record the general scene and the final effect.

28. Pictures of traffic accidents can be used to good advantage in driver safety education (Figure 7) and in defense of claims. Especially when company-owned highway vehicles are involved, good on-the-spot pictures taken as soon as possible after the accident, before the vehicles are moved, can be of great value for claims purposes. Photographic evidence that indicated drinking on the part of a driver involved in an accident is shown in Figure 8. The photo, taken soon after the accident, was important in controlling the monetary loss from an unjust claim.

29. Figure 9, taken on a very cold day immediately after an accident, clearly indicates the cause—a frosted windshield. The driver had scraped a peephole on it through which he thought he could see well enough. The resulting intersection accident proved him wrong.

30. If pictures of traffic accidents are to be used in defense of claims, some of the items to get on film are skid marks; the accident scene, preferably with the vehicles still in place; the location of vehicles in relation to some fixed object, such as a curb, manhole cover, or lamp post; damaged and un-

damaged areas of the vehicles; and, when possible, the occupants of the vehicles.

31. Photographs showing unsafe practices should be used with care. Unfortunately, pictures of safe practices are likely to be somewhat static unless they are set off against pictures of the corresponding unsafe practices. There is always the danger, however, that the viewer will remember only the "wrong-way" picture and will carry away the impression that it depicts the right way. "Wrong-way" photographs, therefore, should always show dire consequences happening or about to happen to the subject (See Figure 6).

32. Color photography is of considerable value in fire protection work; it provides ready distinction between flame and smoke and between different types of flames. Also of value in this work is telephoto equipment or remotely operated cameras for photographing areas which it would be unsafe to approach closely.



Figure 8. Flash photo made of interior of car involved in accident. On-the-spot picture indicates use of liquor by driver. (Courtesy Transit Casualty Co.)



Figure 9. Another photo of a wrecked car immediately after collision. The picture reveals a prime driving hazard—an ice-coated windshield. (Courtesy Transit Casualty Co.)

33. Some of the more technical types of photography, requiring specialized equipment and trained operators, may occasionally be valuable in safety engineering. Examples are X-ray photography for testing of pressure vessels, crane hooks, chains, and other equipment; high-speed motion pictures for slow-motion study of the action of safety devices and machines; photography by polarized light in stress analysis; extreme close-up photography and photomicrography for such purposes as analysis of cross sections of shafts which failed.

34. Suggested subjects and applications of photographs taken to promote industrial safety are listed in the accompanying table. The reader will readily think of additional subjects and uses.

Equipment for Still Photography

35. Types of photographic equipment which the safety engineer may have occasion to use include a simple camera with fixed focus and single speed, a twin-lens or single-lens reflex camera, a press-type camera, a Polaroid® Land camera, and a 35 mm camera. If he wants to take pictures without being observed, he can use a very small 8 mm or 16 mm still camera. He would be well equipped for most

photographic purposes with a twin-lens reflex camera and a 35 mm camera—the first for black-and-white photographs, the second for color.

36. Necessary auxiliary equipments includes a synchronized flash attachment, an exposure meter, and a tripod. Optional auxiliary equipment would be an extension flash unit, an electronic ("strobe") flash unit, reflector floodlights and spotlights, and a couple of simple lamp stands.

37. There is no one best all-purpose camera. For record pictures and on-the-spot pictures of accident scenes, an easy-to-operate camera with fixed focus, single shutter speed, and flash attachment is satisfactory. Few people, however, who seriously take up photography as an aid to their work will long remain satisfied with such limited equipment. Moreover, it may not make satisfactory prints for reproduction, particularly if they must be enlarged.

38. Nearest to an all-purpose camera is the 2¼" × 2¼" twin-lens reflex. It should have matched, fast (f:3.5 or faster) "viewing" and "taking" lenses. The scene is visible in the view finder in exactly the same size as it appears in the

negative. The twin-lens reflex produces a 2¼-inch square negative suitable for sharp enlargements up to 8 inches by 10 inches and larger. Color transparencies also may be made with this camera. They may be shown by means of a projector designed to take 2¼-inch square slides, or they may be masked slightly for 2-inch square "super-slides."

39. The most versatile of all cameras for black-and-white work, and still the favorite of many expert photographers, is the press type. Usually, the 4- by 5-inch size is preferred because of the larger negative. It is excellent for copying and for taking pictures of small objects.

40. The press camera uses cut film or film pack. After one or two pictures have been taken, they may be developed immediately. This feature is an advantage in accident reporting. Roll film may be used with an adapter. For best results, the camera is mounted on a tripod and the scene is composed on the ground glass. The chief objections to this type of camera are its weight and its bulk.

41. The Polaroid® Land camera takes, develops, prints, and produces a finished picture in 10 or 60

PHOTOGRAPHS FOR USE IN INDUSTRIAL SAFETY

SUBJECTS	APPLICATIONS					
	Publicity		Posters and Displays	Training Aids	Talks and Slide Showings	Accident Investigations
	Press and Magazines	Company Magazines and Bulletins				
Safety picture stories.....	•	•		•	•	
Pretty girl pictures.....	•	•	•		•	
Award presentations.....	•	•				
Employee with good safety record.....	•	•	•			
Safety committee group.....	•	•				
Homemade safety device.....	•	•		•	•	
Safety displays.....		•			•	
"What's Wrong with This Picture?".....		•	•	•	•	
Posed accident scenes.....		•	•	•	•	•
Safety equipment and clothing.....		•	•	•	•	
Shattered goggles, damaged hard hats, etc.....		•	•	•	•	
Right and wrong practices, clothing, conditions....			•	•	•	
Housekeeping—good or bad.....	•		•	•	•	
Illustrations for rule booklets, leaflets.....				•		
Job analysis.....				•		
Training series (slides).....				•	•	
Flip charts.....				•	•	
Charts, diagrams, etc. (slides).....					•	
Aftermath of accidents.....						•

seconds. For quick record shots, for testing the effect before taking a picture with another camera, and for various other purposes where immediate results are desirable, the Land camera is ideal.

42. Good pictures, capable of reproduction in print, can be taken with this camera, the results depending upon the skill of the photographer. If enlargements or extra prints are wanted, the print may be copied by customary photographic means.

43. Various types of equipment and accessories for the Polaroid® Land camera are available. There is an extremely high-speed black-and-white film for available light photography, as well as a copier by which prints can be copied on regular Polaroid® Land film. Another type of material produces black-and-white positive slides on acetate base, either 3¼ by 4 inches (lantern slide size) or 2¼ by 2¼ inches.

44. Still another is a film holder designed for 4- by 5-inch press cameras for use with single shot film packets in which prints are developed by the usual Polaroid® Land process. Two types of fast panchromatic films are available for this accessory. One of these films yields, in addition to the 10- or 60-second print, an acetate-base negative which can be processed and preserved.

Slides

45. The 35 mm camera is the choice for making standard 2-inch square (mount size) slides, either in color or in black and white. For copying purposes, the single-lens reflex 35 mm camera gives the most accurate results.

46. For copying charts, diagrams, and similar material, black-and-white film may be used, with positive transparencies being made from the negatives. Charts and diagrams may also be copied in reverse (white lines on black background) on black-and-white film, with the negatives used for projection. Direct positive film may also be used.

47. Charts and graphs in color, as well as black-and-white material,



Figure 10. Projected slides provide inexpensive material for an illustrated safety talk. (Courtesy Modern Railroads.)

may be copied directly on color film. For record or other purposes, flip charts, flannel board material, and the like can be copied on a series of 35 mm color slides. Color is preferred for pictures of people and objects.

48. If duplicate or triplicate sets of slide copies of graphs or other material are needed, it is suggested that two, three, or more shots be made of each subject at the time of the original copying.

49. With a relatively inexpensive 35 mm camera, a projector, and a screen, the safety engineer will be equipped to produce and display slides for demonstrations and illustrated talks (Figure 10) at a modest materials cost per picture.

50. A slide presentation (a collection of slides arranged in sequence to show a picture story) is an effective educational device. For best results, the slide presentation should be made from start to finish in accordance with a script prepared beforehand, with all the pictures taken or selected specifically to tie into the script.

51. To add sound, the safety photographer can synchronize his 35 mm slides to a taped narrative by the use of a projector with a push button or automatic slide changer. "Beeps" or bell tones are recorded on the tape as signals to change the slides. A much simpler method is to read a script keyed

to the slides. Title frames can easily be prepared by various processes.

52. Another method is to use a semiautomatic slide projector with a push-button remote control which permits the speaker to change slides at will from the speaker's stand while reading a script or giving a talk.

Motion Pictures

53. For motion pictures, a camera using 16 mm film, rather than 8 mm film is recommended. Sixteen millimeter is the standard size of film for all commercial purposes except theater projection. All National Safety Council motion picture films, for example, are 16 mm. For ambitious productions, the camera should be capable of a speed of 24 frames per second, to permit sound to be recorded after the film has been processed and edited.

54. Sixteen-millimeter motion picture projectors which can play an optical sound track as well as a magnetic sound recording are available. The same projector may also be used for recording sound magnetically on film footage. For the latter purpose, after the film has been processed and edited, it is sent to a laboratory and a narrow stripe of magnetic material is applied to it. The film is then projected, and the recording is made by means of a microphone plugged into the projector in much the same way as re-

cordings are made on a tape recorder. Voice, music, and sound effects may thus be recorded on and in synchronization with the film.

55. This process is excellent for putting foreign-language tracks on English-speaking films.

56. According to many experts, motion pictures are best suited to motivation and entertainment. For instruction and exposition, other media, such as slides, film strips, and still photographs, are thought to do a better job. However, motion pictures may be used effectively in meetings to illustrate points which are to be emphasized, in job study and job analysis, and in similar ways.

57. The production of movies calls for techniques, knowledge, equipment, and time beyond the resources of most safety men in industry. To achieve success requires much study, practice, trial and error, and wasted film. Before the amateur attempts to produce a movie, he would be wise to read some good books on the subject and to get some competent professional advice as well.

58. A good script, prepared in advance, is essential. It does not pay to be stingy with film; each "take" or sequence must run long enough (a minimum of 10 seconds) for the viewer to take it in when the finished film is shown. Great accuracy is required to determine correct exposures.

59. A professional laboratory can do the editing (a must) and recording and deliver finished prints. It is advisable to check costs of such services before starting.

Basic Points of Technique (Still Photography)

60. The simplest possible procedures are strongly recommended. For example, excellent results generally can be obtained by the use of one or two flash units without resorting to a number of floodlights, spotlights, fill-in lights, or similar equipment.

61. Photography is a skill to be learned. The aim should be to develop the ability to produce sharp negatives which without doctoring

will give good prints for reproduction. The general principles of good photography are the same regardless of the type of camera or film used.

62. It is important that the safety engineer become thoroughly familiar with the camera he intends to use and expert in his manipulation of it. So that operation of the camera and its controls will become almost automatic, "dry runs" over and over are recommended.

63. Skillful operation of a camera requires that these common faults of the novice be eliminated: underexposure, overexposure, picture out of focus, failure to stop action, camera movement. To aid in avoiding some of these errors, the "s-a-f-e" formula may be useful:

Shutter
Aperture
Focus
Exposure

Before taking a picture, the photographer spells the word "safe" to himself and checks each point as he comes to its initial letter.

64. To prevent camera movement and subsequent blurring of pictures, the camera can be mounted on a sturdy tripod in a level position. Other ways to eliminate camera movement are to rest the camera or hand against the forehead or body or on some other solid object, to hold the breath while "squeezing off" the trigger, and to use a fast shutter speed.

65. Lighting is crucial. For most purposes, one or two flashbulbs in reflectors, if properly used, will provide all the light needed. For color pictures, flat lighting is usually desirable. Therefore, the flash should be near the camera.

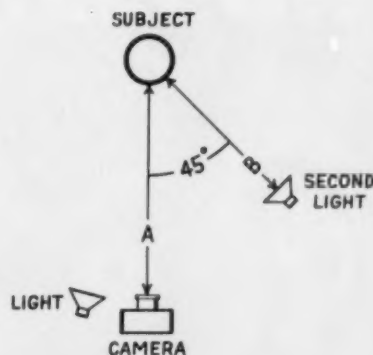
66. If a single flash is used for black-and-white pictures and a little relief effect caused by shadows is desirable, the flash unit should be held above and to one side of the camera by means of a short extension cord. So that both his hands will be free to operate the camera, the photographer can either ask someone nearby to hold the flash gun, which is synchronized with the shutter, or can mount the flash gun on a light stand.

67. An extension flash, also synchronized with the shutter, will give a better effect. In this case, a simple formula for the placing of the lights, which in most situations will give good lighting, can be followed (Figure 11). The same formula can be used for lighting with photofloods.

68. In general, the purpose is to light up the center of interest but at the same time avoid dark shadows or backgrounds. This effect is particularly difficult to achieve when flash is used because it tends to light the foreground and let the background go dark. The photographer can solve this problem by selecting an angle which does not include distant background. For example, a scene can be posed near but not against a wall, or the background can be blocked out with a stack of pallets or the like.

69. Another point is important in the use of flash. The photographer should take particular care not to pick up the direct reflection of the flashbulb on a polished surface, such as a window, mirror, glass block, or glossy painted wall. After the angle has been chosen, a check should be made for such reflection.

70. Use of an exposure meter is recommended for both natural or existing light, and floodlights and spotlights. Professional photogra-



A = Light-to-subject distance
B = Second light-to-subject distance
(approximately $3/4$ of A)

Figure 11. A simple formula for placement of two lights of equal strength (flash or flood) for effective illumination of subject. Distances are gauged by eye-shot estimate.

phers often "bracket" their shots, taking one picture at the indicated exposure, another a stop or two below, and a third a stop or two above. They then select the best negative after the films have been developed.

71. With extremely fast films, both color and black and white, it is often possible to take pictures by available light, even indoors, at snapshot exposures. Under these circumstances, however, it is often desirable to fill in background shadows or highlight the subject by the use of flash. "Bounced" flash (achieved by directing the reflector at the ceiling) is recommended in such cases.

72. An exposure meter cannot, of course, be used for flash. In this case, exposures should be calculated carefully on the basis of guide numbers furnished by the manufacturer of the flashbulbs or in the instruction sheet that comes with the film.

73. A good picture requires composition, which means simply a pleasing arrangement of the elements in the picture. When composition is good, the viewer's attention is directed to the center of interest and the picture tells its story to best advantage.

74. The angle from which the picture is taken often means the difference between a good picture and a bad one. It is desirable, therefore, for the photographer to work without haste and to check everything carefully before making the exposure. The job will be greatly facilitated by use of a tripod.

75. It is often a good idea to take the same scene from several angles since a print taken from one angle may show things which are not noticed on the spot or not reproduced on the prints taken from the other angles. This procedure is recommended especially for accident investigations.

76. The picture is composed on the view finder or on the ground glass. On the press camera, the image on the ground glass is upside down; on the twin-lens reflex camera, it is right side up but reversed from right to left. After becoming familiar with these differences, the photographer will not find them troublesome.

77. In a safety picture, it is particularly important that no unsafe element slips in unnoticed, especially if the purpose is to show safe practices or conditions. The subject may be an excellent example of safe attire and deportment, but the entire point will be lost if a man in the background is using a grinding wheel without wearing eye protection. Again, the machine in the foreground may be guarded to the hilt, but a broken ladder leaning against the wall just beyond will ruin the picture, so far as safety purposes are concerned. Likewise, debris on the floor, unnoticed when the scene is taken, will spoil an otherwise good safety picture.

78. By moving in as close as possible to the subject, the photographer can eliminate undesired elements, distracting details, and confusion or darkness of background.

79. Often the photographer must take snapshots with the camera held in his hands. Even then, by using care and judgment, he can usually choose an advantageous angle, compose in the view finder, and eliminate the undesired elements. He should remember that the camera will usually record a greater area than he sees in the view finder.

80. The photographer should always bear in mind the requirements of a print for reproduction and strive to make all pictures up to that quality. For reproduction by a halftone cut or an offset plate, it is best to provide an 8-inch by 10-

inch glossy print in which details are sharp, the story is told effectively, and the center of interest is highlighted, with good but not excessive contrast and with no deep shadows.

81. The quality of the finished print can be controlled to some extent by the darkroom techniques used in the enlarging process. Composition can be improved and unnecessary detail eliminated by "cropping" (enlarging only a selected part of the negative). Contrast can be increased or decreased and excessively dark or light areas can be brought into balance by "dodging" (holding back light from certain areas of the negative as the image is projected on the paper). Expert retouching and airbrush work on the print also can do much to achieve desired effects in a photograph.

82. It is a good idea to inspect the negative and the test print before the finished prints are made, to determine how they should be treated. If doctoring is needed, such as cropping or altering of contrast, suitable instructions can then be given to the photofinisher.

Other Considerations

83. Most people like to see themselves in print, provided that they are shown in a favorable light. Publication of employees' pictures in the company magazine creates good will. However, certain pitfalls must be avoided.

RELEASE NO. _____	
Date	_____
Place	_____
For the consideration of _____, the undersigned grants permission to _____ and its assigns, to publish and reproduce the attached photographs of persons or objects shown therein. It is understood that my name will not be used in connection with the aforementioned pictures.	
It is further declared that the undersigned has legal authority to sign this document.	
_____	_____
Description of photographs	Witness

Figure 12. A simple form of model release.

Willson first with respiratory protection against rocket propellants

Now, people working with exotic space age chemicals have fully portable emergency protection against dangerous vapors and gases. Willson rocket propellant gas mask and canister meet M21 specifications of the Protective Development Division, U. S. Army Chemical Research and Development Laboratories, Maryland. These Willson protectors neutralize toxic acid, organic and ammonia-type liquid propellants: red fuming nitric acid (RFNA), unsymmetrical dimethyl hydrazine (UDMH), hydrazine, hydrogen peroxide, kerosene, aniline, alcohol, and splashes from liquid nitrogen tetroxide.

Also available: military-type Willson rocket propellant canister with prefilter for radioactive and bacteriological dusts and smokes.

To see why Willson rocket propellant gas masks and canisters already are in use in leading factories and military installations everywhere, please turn the page.

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*please
turn the
page*

TITAN, ICBM,
MARTIN COMPANY



Willson rocket propellant canister carried on back (top photo) allows more freedom in confined space. Keeps canister away from heaviest gas concentration. Rubber half mask (bottom photo) covers nose and mouth airtight for escape protection. Pleated nosepiece, soft rolled edges, and chin cup fit any face comfortably. Threaded connector on all canisters.



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Because of economical pricing, Willson rocket propellant gas masks and canisters can be used to protect more people over a wider area. The same dollar expenditure will provide escape protection for four times as many people as can be equipped with expensive self-contained breathing apparatus.

Control eager "hypergolic" propellants (fuel and oxidizer combinations which ignite instantly when mixed).

Willson offers this exclusive line of protection against rocket propellant hazards:

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Special military M15-type canister with prefilter for radioactive and bacteriological dusts and mists.

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Gas mask with half facepiece.

Gas mask with standard Willson facepiece and six-strap head harness adjustment.

Gas mask with full-face Scottoramic window and Willson Tite-Seal® headgear.



Exclusive Willson Tite-Seal® headgear for full facepiece rocket propellant gas mask permits easy, immediate airtight adjustment. With Tite-Seal® headgear two ratchet adjustments can be preset for a permanently adjusted fit. Immediately useful in any emergency. Headgear molded of low-moisture-content nylon—lightweight, easy to clean, unaffected by temperature extremes, fits under safety hats or caps . . . AND it is Bureau of Mines-approved.

Willson is first with a rocket propellant gas mask and canister, and has produced more of these units than any other manufacturer. All Willson rocket propellant gas masks are manufactured to exacting standards of quality control; these have been verified by official tests in accordance with procedures prescribed by Chemical Corps Purchase Description M21.

Order rocket propellant gas masks and canisters from your local Willson safety equipment distributor or send coupon.

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is worth
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Willson Products Division

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In Canada: Safety Supply Company

84. Before large-scale photographic operations are undertaken on company premises, clearance should be obtained from production officials and supervisors and necessary arrangements should be made. The question of who is going to pay workers used as models or diverted from their work during the picture-taking session should be resolved, especially if some of the workers are on piece-work or incentive rates. Also, if there is any possible question affecting job conditions, it is well to head off trouble by having a fully informed union steward present during the taking of the pictures.

85. If an employee is depicted in an unfavorable way or in a manner which holds him up to ridicule, he may have cause for action against the publisher. Laws in some states forbid publication of a person's photograph without his written permission. If there is any doubt, the safe way is to give the subject a nominal consideration

(usually \$1.00) in exchange for his signature on a "model release." Standard model release forms (Figure 12) are available from photo supply houses and other sources.

86. It is well to remember also that pictures showing bad house-keeping in a recognizable area, or anything else that directly brings discredit to a supervisor or an employee, can create enmity or a spirit of mistrust if they are used indiscreetly.

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How To Take Better Pictures in Black-and-White

How to Make Better Color Pictures

Eastman Kodak Company, Rochester 4, New York.

How to Make Good Pictures (good as a beginning; principally devoted to home and vacation photography)

This Is Photography (more advanced, but not highly technical)

Kodak Books and Guides (a catalog of numerous data books and other publications, advanced and otherwise)

Polaroid Corporation, 741 Main Street, Cambridge, Massachusetts.

On Your Feet (description of Polaroid Transparency System; how to give an effective slide presentation)

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ACKNOWLEDGMENT

This data sheet was prepared by the Committee on Safety Standards of the St. Louis Chapter, American Society of Safety Engineers, D. A. Gemming, Chairman, and M. G. Bullock, Member. Content has been extensively reviewed by members of the National Safety Council, representatives of chapters of the American Society of Safety Engineers, leading photographic equipment manufacturers, and a number of photographic experts. It has been approved for publication by the Publications Committee of the Industrial Conference of the National Safety Council.

ENCOURAGEMENT of eye safety among youth is the aim of the Junior Wise Owl Club of America, organized recently by the National Society for Prevention of Blindness.

Patterned on the Wise Owl club for grownups, the group's aim will be the replacement of ordinary prescription lenses with shatterproof lenses, and the faithful use of protective eyewear by children engaged in hazardous activities.

The junior group has been formally organized with the presentation of charter certificates and pins to two 13-year-old boys who owe their eyesight to safety lenses. Safety-conscious parents, familiar with eye protection on the job, were responsible for the sight-saving eyewear worn by both boys.

Robert K. Chapin, Mahwah, N.J., had been given a pair of safety glasses by his father, a senior metallurgist in American Brake Shoe's Mahwah Research center. Robert wore the glasses when he was helping clear rocks from a field near his home. When a rock splintered and struck the lens of his glasses, Robert's eyes remained unharmed.

The second charter member,

Junior Wise Owl Club of America

Edward L. Sinclair of Greenwich, Conn., accidentally toppled down a flight of stairs when leaving Sunday school. His face was scraped and his glasses badly damaged and battered, but thanks to prescription

safety glasses he wore, his eyes were not injured. His father, manager of the Socony Mobil Company's Engineering Department in New York, had insisted on the shatterproof lenses.



Charter members of the Junior Wise Owl club show the reasons they can still see.

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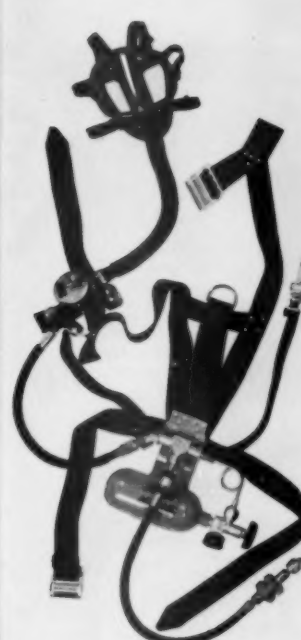
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THE SAFETY LIBRARY



Reviews of books, pamphlets and periodical articles of interest to safety men

By LOIS ZEARING, Librarian, NSC

Introduction to Health Statistics

Introduction to Health Statistics By Dr. Satya Swaroop. 1960. 255 pp., plus appendices. E & S. Livingstone, Ltd., Edinburgh and London. \$8.50.

DR. SWAROOP—chief statistician in the Health Statistics Methodology Section of the World Health Organization—has taught at Johns Hopkins School of Public Health, and is thoroughly qualified to write an introductory book on health statistics.

Many nations have compelling disease problems, and their public health personnel must have training in collecting and interpreting accurate and useful knowledge of their populations.

Dr. Swaroop has succeeded in making technical points easy to understand—a requisite for many countries lacking highly trained professional personnel.

He has given the entire statistics picture in sufficient detail to enable the reader to set up a modern health statistics administration.

Included in the book are tables giving annual mortality and natality figures as far back as 1750 and 1800 in certain northern European countries.

While the book is directed primarily to public health people, there are many items of interest to workers in the safety field. The chapters on designing record card systems, sampling, and especially the measurement of morbidity have application in safety work.

J. L. RECHT

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"The Treatment of Industrial Hand Injuries. Part II. Tendons and Nerve Injuries." Burt C. Kilbourne and Eudell G. Paul. *Journal of Occupational Medicine*, November 1960, pp. 549-553.

Health Hazards

"Bagassosis." Howard A. Buechner. *Journal of the American Medical Association*, November 5, 1960, pp. 1237-1241.

"Dust Diseases in Dundee Textile Workers: An Investigation Into Chronic Respiratory Disease in Jute and Flax Industries." A. Mair and others. *British Journal of Industrial Medicine*, October 1960, pp. 272-278.

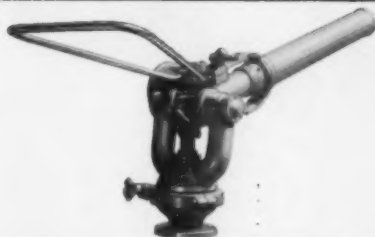
—To Page 114

Most Complete Line of Specialty Turrets on the Market!

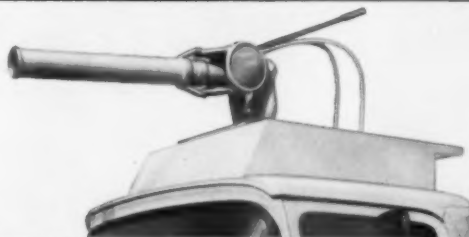
...All Rockwood Turrets Discharge FogFOAM
Solid FOAM Stream — WaterFOG — Solid Water Stream



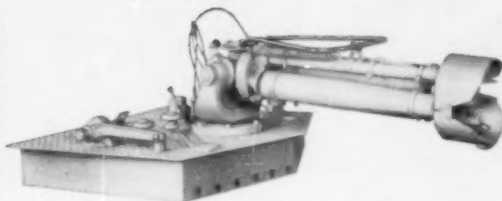
Extended Manual Control Type — Turret nozzles extend 10 to 20 feet above remote control station on deck or ground on standard units ... greater remote extensions for special applications.



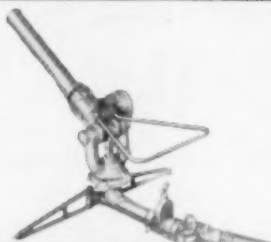
Direct Manual Control Type — Gives fire fighters "out-in-the-open" control from cab roof!



Remote Manual Control Type — Easily handled by man in driver's seat. Ideal for fast action!



Remote Hydraulic Control Type — Power-controlled from within the cab. Single and dual models. Widely used on air crash rescue fire-fighting trucks.



Portable Type — Off the truck and into action in seconds! Goes wherever a fire fighter can bring the proper hose line into action!

On the truck or on the ground, fire fighters can hit fires *harder* using ROCKWOOD Turrets! At airports and refineries ... in municipalities and throughout industry ... these advanced-design fire-fighting aids are constantly proving their ability to extinguish fires faster.

ROCKWOOD Turrets provide plenty of volume and versatility.

What's more, all are easily adjustable on the fire line to meet changing fire conditions. Produced by the world's largest manufacturer of specialty Fire-Fighting Turrets, they're designed to give fire fighters an extra edge of efficiency on most types of fires. Get full details on the complete line of fire-fighting products. Write ROCKWOOD SPRINKLER

COMPANY, Portable Fire Protection Division, 468 Harlow Street, Worcester 5, Massachusetts.

ROCKWOOD SPRINKLER COMPANY

A Division of The Gamewell Company
Subsidiary of E. W. Bliss Company

Engineers Water

... to Cut Fire Losses
Distributors in all principal cities.

imitated imitated imitated
but not duplicated
 imitated imitated imitated

Only Fendall Safety Glasses
 offer this combination of features



Adjustable temple joints



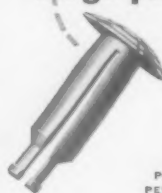
Front end of temple is designed so it can be adjusted for perfect temple fitting on all faces. For a narrow face, bend it in; for a wide face, bend it out; permits temple adjustment to provide exact amount of side tension to prevent slippage.

Multi-fit bridge



Fendall's patented Multi-Fit Bridge automatically fits 9 out of 10. Self-adapting to wearer's face, no adjusting. You can fit practically every worker with this one bridge size. Reduces inventory. Unequalled fitting ease and wearing comfort.

Lok-tite hinge pins



This exclusive Fendall feature eliminates the trouble and annoyance caused by loose and lost temple screws. Fendall's Lok-Tite Hinge Pins snap in easily, lock in position, cannot fall out, yet they are simple to remove, if necessary.

NEW LENS SHAPE provides closer orbital fit, wider vision, increased safety.

SPECIAL SKULL TEMPLES of nickel silver, with molded plastic paddles. Easily adjusted for perfect fit, no slippage.

COLORLED FRAMES—Available in flesh, bronze, cordovan and green.

SPECIAL INSULATION on cable-type temples. Will not loosen. Perspiration-resistant.

SMART MODERN STYLING—Sturdy and comfortable, without the bulky look and feel of "goggles."

Choice of acetate or metal frames, skull temples, cable temples, sideshields, etc.

Send for complete details now!

FENDALL PRODUCTS



FEND ALL HAZARDS

FENDALL COMPANY

2222 DIVERSEY BLVD., CHICAGO 47, ILLINOIS

Distributed in Canada by Levitt-Safety Limited

They Breathe Easy

— From page 33



To insure communications in emergency forced use of this air line respirator, the mask has a built-in speaking diaphragm which would allow use of the sub's sound-powered telephone.

could be reached quickly during any condition that would not permit us to breathe the ship's normal air supply," LCDR Lalor said. "The most probable cause of this would be fire. Of course there can be other causes too."

Each of the air line respirators includes a speaking diaphragm that is resistant to acid, heat, or corrosive materials. This device transmits speech naturally and without distortion in gas or smoke-filled air.

Availability of the speaking diaphragm permits — or would permit in an emergency — continued use of the sub's sound-powered telephone system, according to LCDR Lalor. This uninterrupted use of communication is "valuable," he said. "You have to be able to talk to the man next to you, and with others in all parts of the ship."

Although there has been no emergency requiring use of the respirators aboard the Seadragon, safety drills are a regular part of sub life. For example, LCDR Lalor reported that the respirators were "broken out" at least 15 times during a two-month cruise.

There are special classes for all new personnel, who are checked out on artificial respiration, use of the respirator, and other first aid equipment and applications. The periodic drills — for fire, passive defense, radiation, steam leak, toxic gas, and other possible hazards — serve as a continuing check of these men and the "regulars."

Welders wear comfortable, lightweight cotton coveralls treated with "X-12" flame retardant, instead of heavier garments.



Give employees the safety and comfort of work clothing protected with Du Pont "X-12" FLAME RETARDANT

Many of your production and maintenance personnel, such as these welders, are exposed daily to fire hazards. You can give them protection without loss of comfort when you have clothing treated with Du Pont "X-12" Flame Retardant.

Work clothing and uniforms can be treated with "X-12" during laundering. Treated garments will not support fire, and only char during exposure to flame.

"X-12" doesn't change the appearance, color, feel or the tensile strength of fabrics. And, since it penetrates the fabric and allows the garment to "breathe", it doesn't interfere with clothing comfort.

A growing number of commercial and industrial

laundries offer this low-cost treatment. For more details, send the coupon below.



**"X-12"
FLAME RETARDANT**

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Industrial and Biochemicals Dept.
Rm. 2539 SN, Nemours Bldg., Wilmington 98, Del.

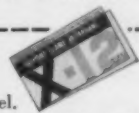
Please send booklet describing the advantages of work clothing treated with "X-12".

Name

Company

Address

City State



3 TIMES MORE WEAR THAN ORDINARY COATED GLOVES MULTI-PLI PACEMAKERS

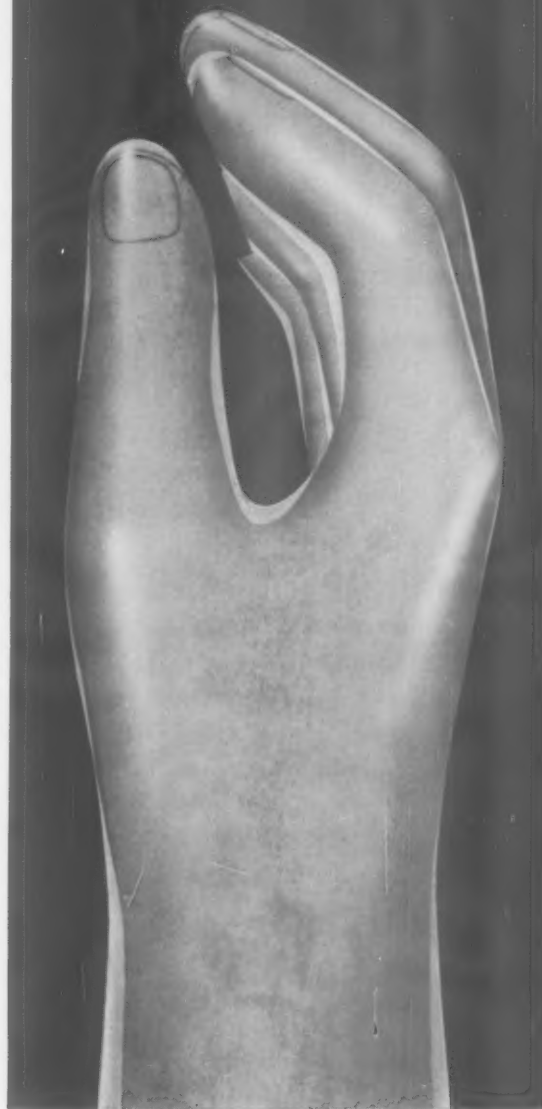
This new Pioneer Pacemaker cushions wear with reinforcement on palm and thumb crotch. Glove coating of black liquidproof neoprene is extra-thick on heavy wear areas. Knit-wrist, or 12" or 14" gauntlet styles. Write for Multi-Pli Catalog Sheet.



The **PIONEER** Rubber Company, 237 Tiffin Road, Willard, Ohio

BARE-HAND DEXTERITY SHEERER THAN A SURGICAL GLOVE NIMBLE FINGERS

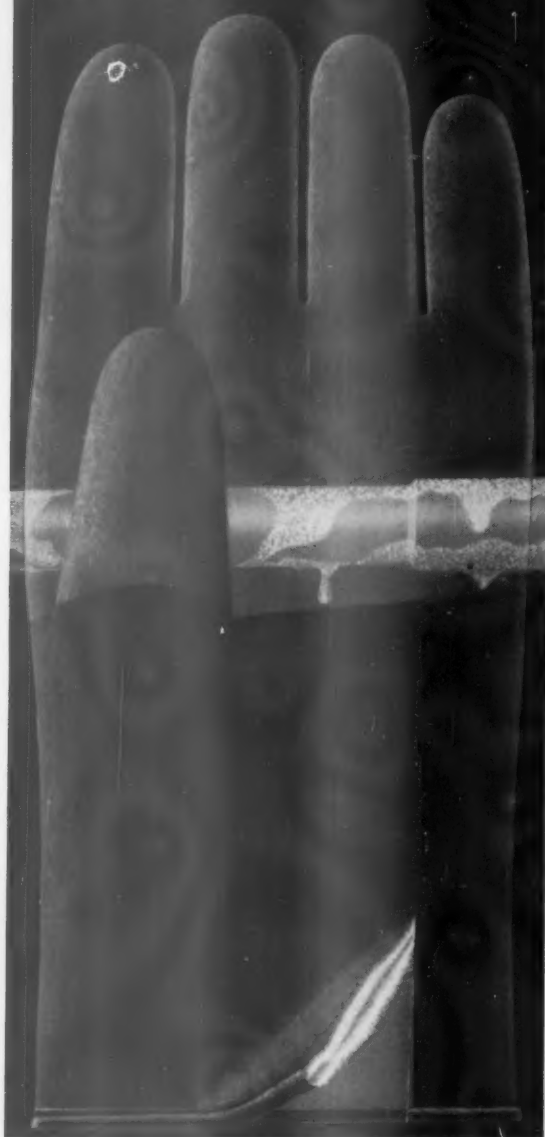
Protect your products from handling. Of tissue-thin, liquidproof Pylox™, textured inside to provide a non-slip grip when reversed. S-M-L-XL sizes. Check all Pioneer styles in your free copy of the Industrial Glove Catalog. Just write to...



The **PIONEER** Rubber Company, 237 Tiffin Road, Willard, Ohio

EXTRA TEMPERATURE PROTECTION TWIN-LINED NEOPRENE PACEMAKER HOT 'N COLD 225

Liquidtight insulation from extreme hot and cold is provided by a liner of double-napped flannel inside a neoprene coated flannel shell. Bar-tacked fingertips secure the liner. Mahogany Red with safe non-slip finish, in 12" gauntlet style. Write for your copy of the Pioneer Buying Guide Wall Chart ...



The **PIONEER** Rubber Company, 237 Tiffin Road, Willard, Ohio

National Safety News, February, 1961

EXTRA COMFORT CHEMICAL PROTECTION FLOCK-LINED NEOPRENE STANZOIL NS-35

Lined with millions of tiny cotton fibers bonded to the inner surface to make it easy to slip on and off. Of chemical resistant Milled DuPont Neoprene. Embossed non-slip grip. S-M-L sizes. Choose the right glove for every job with Pioneer's Foolproof Glove Selector. Write for your copy ...

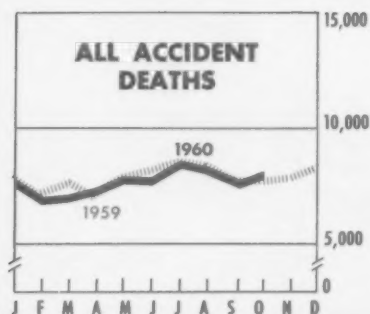


The **PIONEER** Rubber Company, 237 Tiffin Road, Willard, Ohio

CIRCLE 13 ON READER CARD

THE ACCIDENT BAROMETER

Prepared by the Statistics Division
National Safety Council



THE NATIONAL ACCIDENT FATALITY TOLL

	October			Ten Months		
	1960	1959	Change	1960	1959	Change
Total	8,000	7,500	+ 7%	76,400	75,400	+ 1%
Motor-Vehicle	3,680	3,440	+ 7%	31,120	30,660	+ 2%
Public (except M.V.)	1,300	1,200	+ 8%	14,300	14,350	0%
Home	2,100	2,000	+ 5%	21,900	21,400	+ 2%
Work	1,200	1,100	+ 9%	11,600	11,500	+ 1%

WORK INJURIES

21 NATIONAL SAFETY COUNCIL CONTESTS

Disabling Injury Frequency Rates

	1960	1959	Change
October	6.56	7.12	- 8%
Ten Months	6.30	6.53	- 4%

MOTOR VEHICLE DEATHS

TEN MONTHS 1960

CHANGES IN DEATHS

Number of Reporting States

29
0
19

UP from 1959
SAME as 1959
DOWN from 1959

Number of Reporting Cities Over 10,000 Pop.

316
167
260

GREATEST PER CENT REDUCTION IN DEATHS

States

Rhode Island	- 29%	Grand Rapids, Mich.	- 50%
New Hampshire	- 24%	Akron, Ohio	- 38%
Nebraska	- 18%	Worcester, Mass.	- 35%

Cities Over 200,000 Pop.

HOME AND PUBLIC DEATHS

TEN MONTHS 1960

HOME DEATHS

UP from 1959:

Firearms
Fires, burns
Poison gas
Poisonings

DOWN from 1959:

Suffocation
Falls

AGE GROUPS

Change from 1959

Home		Public
Down	0- 4	Down
Up	5-14	Up
Down	15-24	Down
Up	25-44	Down
Up	45-64	Down
Up	65 & Over	Up

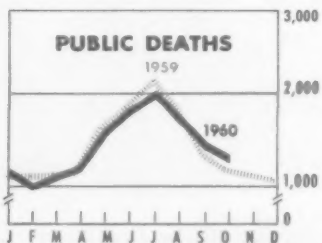
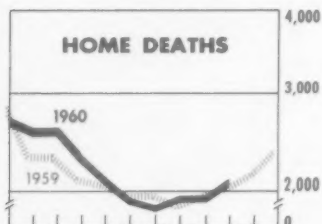
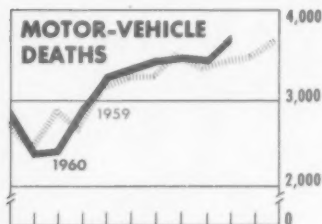
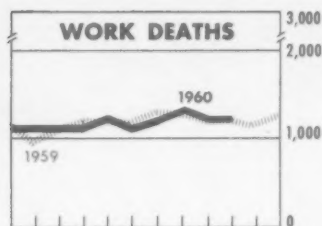
PUBLIC DEATHS

UP from 1959:

Drownings

DOWN from 1959:

Transportation
Falls
Firearms



For work or play... the safe, comfortable way



No. 612

A 8-12 C 6-12
B 7-12 D 6-12
E 6-12

NEW! **Iron Age** *Softone* SAFETY OXFORDS

Once in a blue moon a really distinctive safety shoe comes along. Such is the Iron Age "Softone." It's crafted in rich, suede finished steerhide leather. The color is called Loden green. This is a subdued shade of green. Actually, at first glance this safety shoe looks black, then you'll notice the soft green undertones that add distinction and superior value.

The Iron Age "Softone" is just as comfortable as it looks. It is quality crafted with a sturdy steel toe cap which meets ASA specifications, Dacron* stitching, Pacifate* protected lining and sweat resistant leather insole. The uppers are tanned with Scotchgard* brand leather protector to repel acids, oil, moisture

*Trademark

and mold. Ask our salesman to show you the remarkable "ink test."

Underfoot there's the superior value of long wearing Vylt* soles. This soling is light weight, oil resistant, corrugated to prevent slipping and provides a cushioned walk.

What's the cost for all this extra value? No more than you would pay for ordinary safety oxfords. Your workers will save money through longer wear. And you'll save money by increasing your coverage and having fewer foot accidents. For a showing, write Iron Age Division, H. Childs & Company, Inc., 1205 Madison Avenue, Pittsburgh 12, Pa.



Iron Age Steel Toe SAFETY SHOES

OFF THE JOB

Planning safety programs for your
plant and community



By PAUL E. SHEPPARD

Director, OTJ Safety Activities



New editor of the Off-the-Job Department is Paul E. Sheppard. He also is staff representative for the Public Utilities section. Sheppard joined NSC's Industrial Department in 1957. Previously, he had been safety director for St. Petersburg, Fla. Sheppard is a member of ASSE and former ASSE chairman in Milwaukee.

Defensive Driving Taught To 1200 Esso Workers

One of the most comprehensive and successful off-the-job programs brought to our attention recently was a defensive driving course co-sponsored by the Esso Safety Foundation and the Esso Bayway Refinery for the latter's 1200 employees and their families.

More than 97 per cent of the employees attended all four sessions of the course.

Esso safety men planned the course when they found that while

the firm's off-the-job injuries had decreased from 263 in 1956 to 59 in 1959, off-the-job vehicle accidents had increased from 18 in 1956 to 34 in 1959, including one fatality in that year.

Further study showed off-the-job traffic accidents resulted in 54 per cent of the total days lost due to off-the-job injuries.

The course was drawn up with the aid of such agencies as the New Jersey Division of Motor Vehicles,

State Police, and the New Jersey Safety Council.

A pilot course was held for a sample group, and it was then scheduled for all company employees. Announcement of the course was made in a letter to employees from the plant manager. The letter was accompanied by an information sheet and a kit of promotional material.

Classes were held on four consecutive Tuesday or Thursday evenings, from 7:30 to 9:30 p.m., with about 600 persons — employees and family members — attending each of the sessions.

Group discussions, film presentations, transparencies, psycho-physical tests and demonstrations were used to present the program in an interesting and educational manner.

The highest 15 scorers on a driver knowledge test were selected as participants in a "rodeo" contest for top prizes.

An evaluation of the program indicates the firm is currently experiencing the lowest off-the-job and on-the-job disabling injury frequency rates it has recorded.

The program is described in a brochure available from the Esso Safety Foundation, 15 W. 51st St., New York 19; or Safety Division, Esso Standard, Division of Humble Oil and Refining Co., Bayway Refinery, P.O. Box 222, Linden, N.J.

Quarterly reports covering the third quarter of 1960 have been tentatively summarized.

Review of 125 reports, representing 1,567,146 employees, indicated the following:

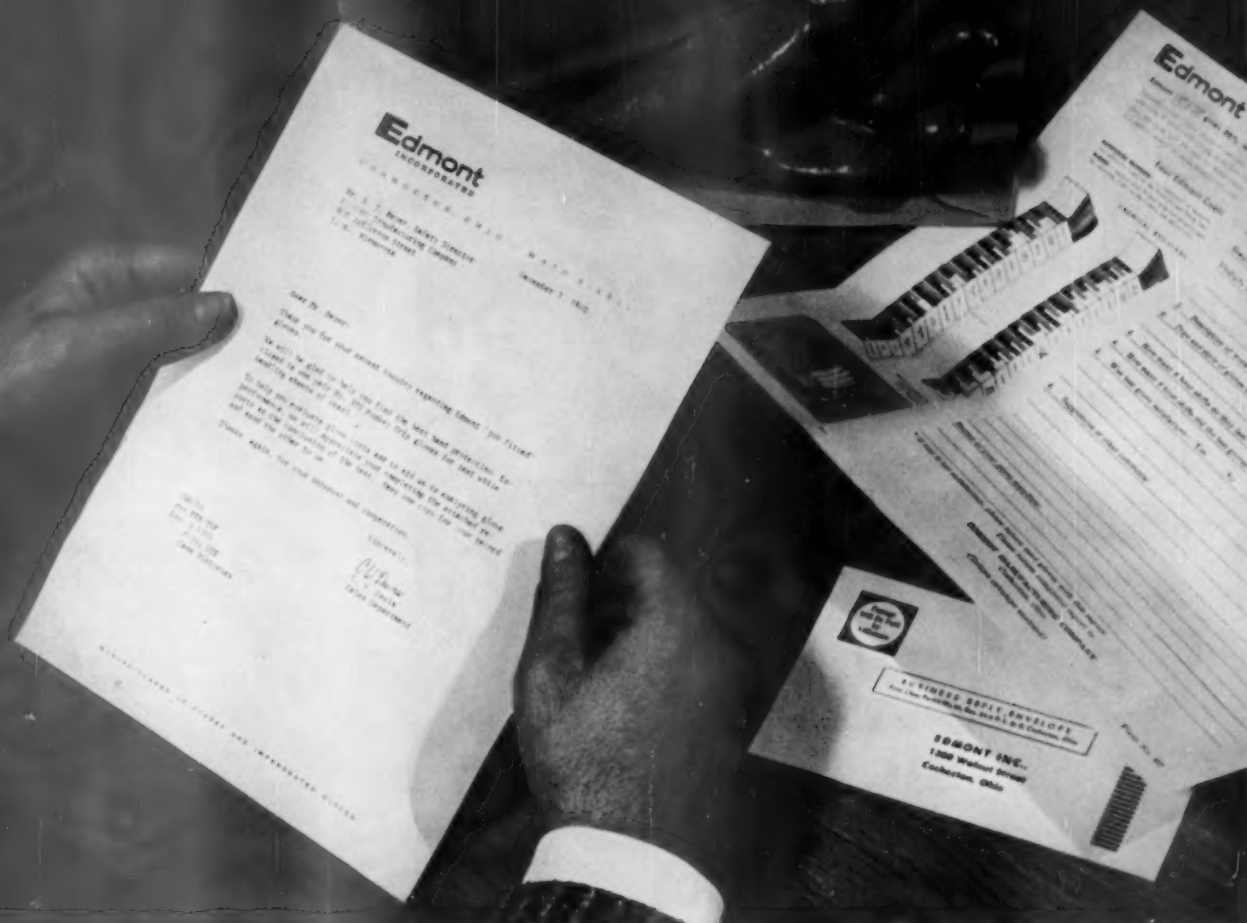
Off-Job Summary for Third Quarter of 1960

<i>Injury occurred</i>	<i>No. of injuries</i>	<i>Fatalities</i>
Transportation	2691	52
Home	4649	12
Public	3175	16
	10,515	80

A total of 191,728 man days were lost during the period due to off-the-job injuries.

Based on 312 hours per employee per month the frequency rate for

the third quarter was 7.17 injuries per million man hours. This compares with a 7.45 frequency rate for the second quarter of 1960, these quarterly reports show.



EDMONT TEST KITS offer on-the-job proof of 40% to 70% savings

There is one way to be sure you are buying the best glove...test it

Safety-conscious management, alert to the increasing cost of "nuisance" hand injuries and lost-time accidents, has turned glove selection into a science.

Edmont co-operates by studying hand protection problems and then recommending gloves and supplying samples for on-the-job testing. Resistance to cuts, punctures, abrasion, heat, oil, chemicals and solvents can thus be determined. The results are documented proof that Edmont job-fitted gloves protect better, wear longer and cost less than other gloves on most operations. For example:

CASE No. 530: Handling rough lumber, Monkey Grip gloves, coated with tough

vinyl, outwore \$1 a pair leather gloves 22 shifts to 12 and gave better protection against jagged splinters. Glove costs dropped 64%. Its easy-flex liner, wing thumb and preflexed fingers also provided outstanding fit, grip, flexibility and comfort.

CASE No. 621: Handling appliance parts in trichlorethylene, Neox gauntlets, coated with reinforced neoprene, outwore more expensive ordinary neoprene gauntlets nearly 2 to 1, at a 75% saving in glove costs.

CASE No. 620: For winding motors, nimble fingered Werx gloves, made of vinyl impregnated fabric, outwore goatskin

gloves 11 shifts to 6, reducing glove costs 69%.

FREE TEST OFFER TO LISTED FIRMS: Tell us your operation and materials handled. From more than 50 types of Extracoated and impregnated gloves, we will recommend correct gloves and send samples for on-the-job comparison test. Write Edmont Inc., 1205 Walnut Street, Coshocton, Ohio. In Canada, write Edmont Canada Ltd., Cowansville, Quebec.

Edmont
JOB - FITTED GLOVES

Correction — 1961 Industrial Section Chairmen

An error in preparing the listing of Industrial Section Chairmen for 1961 (NSNews, January 1961, p. 49) reversed the Air Transport Section and Automotive and Machine Shop Section chairmen.

The listing should have read:

Air Transport

General Chairman: N. L. Christoffel, staff superintendent, safety, United Air Lines, Inc., Stapleton Airfield, Denver, Colo.

Vice Chairman: Dr. Gilbert E. Teal, senior scientist, Public Service Research Institute, Inc., Stamford, Conn.

Automotive and Machine Shop

General Chairman: George E. Humphrey, safety director, Cadillac Motor Car Div., General Motors Corp., Detroit.

Vice Chairman: R. M. Coe, safety director, Goodman Manufacturing Co., Chicago.

W. R. Gilliland, assistant safety director, Aluminum Company of America, Pittsburgh, Pa., is general chairman of the NSC Metals Section.

Diary of a Safety Engineer

— From page 10

and so on. But after a few minutes of this pleasanter talk, he suddenly returned to the attack:

"Now why isn't work of this type enough? Put up your posters, have your foreman training classes, do a good safety engineering job on all new installations, keep on top of the vehicular and pedestrian traffic problems. Then, when you have time, work with the plant safety men and managements on special problems.

"What is so damned important about inspections anyway? I've always heard it was the human factor, more than the mechanical, that caused accidents. If you'd just keep in touch with the people and know what's going on in their minds, it would be better than looking into trash baskets and crabbing about the state of the janitor work."

Suddenly I awoke to a point I'd missed entirely: I wasn't communicating with my new boss. I was so used to speaking of inspections in housekeeping terms and taking for granted the human-relations side of them, I must have misled my boss.

I did a fast switch, pointing out that our inspections had, as their primary value, the bringing of contact between safety man and the life of the plant, that we inspected for human behavior as well as physical conditions of the plant.

I don't know how convincing I was. But if I haven't already convinced him, I'd better do so soon! This is one argument I don't dare lose.

Home Fire Check List Available

A check list—to aid in tracking down home fire hazards—is available. The pamphlet suggests a plan for methodical inspection of homes, pointing out the most frequently encountered hazards and how to eliminate them.

Copies of this publication can be obtained by contacting: Fire Division, Kemper Insurance Co., Kemper Building, Chicago 6.

CIRCLE 17 ON READER CARD →

National Safety News, February, 1961



MAN TO MAN

you know that

CHANGEABLE COPY SAFETY SIGNS

ARE EFFECTIVE WHERE PERMANENT SIGNS FAIL!

Only Wagner Letters can be satisfactorily and rapidly changed with a "mechanical hand". No ladder climbing required.

WAGNER SIGN SERVICE, INC.

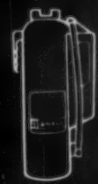
356 S. HOYNE AVENUE CHICAGO 12, ILLINOIS

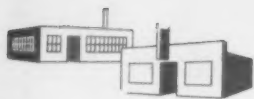
Please send free data file on Safety Promotion.

NAME _____ COMPANY _____

STREET _____ CITY & STATE _____

CIRCLE 16 ON READER CARD





SMALL BUSINESS and ASSOCIATIONS

By **RAYMOND C. ELLIS JR.**, and **JOHN T. CURRY**

Small Business Program Staff, National Safety Council

One Day Course For Supervisors

Feeling most small businesses lack personnel, time or inclination to give adequate consideration to safety, the Texas Safety Association recently published a manual — *Supervisors Safety Training Conference for Small Industries* — designed as an outline for a one-day course.

The outline published for basic safety training should be of value to other associations wishing to help smaller businesses in their own communities:

Basic elements listed for a good safety program are:

1. Management leadership.
2. Assignment of responsibility.
3. Accident record system.
4. Safety training program.
5. Maintenance of safe working conditions.
6. Employee acceptance of safety responsibility.
7. Medical and first aid system.

Among points which should be brought to the new employee's attention are:

1. Good health practices — sufficient sleep, balanced diet, "relief for anxieties."
2. Clothing — well fitted but not baggy, shirt tail in, protective apparel (company policy should be stated on hard hats, eye protection, gloves and safety shoes).
3. Smoking — safe areas, safety matches recommended.
4. Safety meetings — briefing on where and when held, subjects covered, and attendance requirements.
5. Safe work practices — geared to the worker's specific duties.
6. Injury reporting procedures — first aid procedures, use of first-aid kits, obtaining medical treatment.
7. Fire protection — location and use of equipment.

**WE
HAVE WORKED
2 2 5
Days Without a Lost-Time Injury**

**ACCIDENTS DON'T HAPPEN
THEY ARE CAUSED**

Note: A lost-time injury results when a person is injured so seriously that he is unable to return to his job the next day following his accident.

**Safety Committee
NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES**

NARW Safety Committee Develops Wheel Card

The National Association of Refrigerated Warehouses recently announced availability of a no-accident wheel card, seen here. This is available as a sale item from the association office.

In reporting to NARW members, the committee urged these wheels be placed in strategic locations throughout the plant so a current, daily record might be maintained by turning the wheels one number higher each day.

As the figure on the card becomes higher, employees take increased pride in the safety record

and are more conscious of conditions and practices that could lead to a disabling injury.

To provide a constant awareness of the plant's record, the wheel cards should be placed in strategic locations so all employees will see them—dock, engine room, office, locker rooms, at entrance to storage rooms.

This is another example, demonstrating how an association can effectively extend safety to its members through a volunteer safety committee that is active and resourceful.



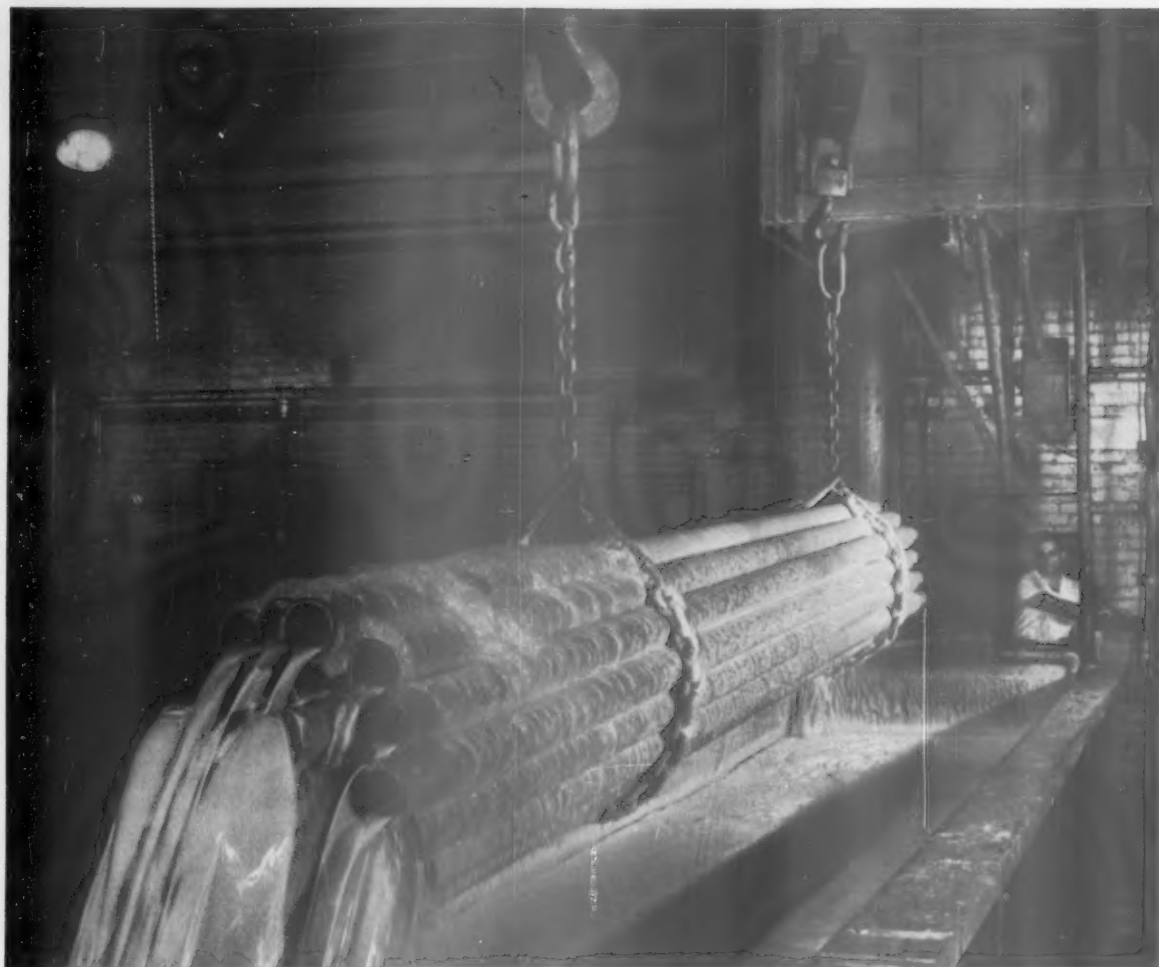
all round protection

In a lightweight safety shoe—you've never had it so good before! Why? Take a look at that sole. It's natural Vylite®—as different as it looks. Much lighter and more flexible than most other soles, it gives you *better* resistance to chemicals, moisture, abrasion and grease. So do the storm-welted sides and uppers of Quilon®-tanned glove leather, because Quilon-tanning really toughens up a shoe (without adding weight). Yet that glove leather is as soft as—glove leather, so this shoe looks as good as it feels! Steel toe-box. Style S-4382, amber color, C 7-11, D 6-12, E 6-12 and EE 6-11.

Thom McAn
A DIVISION OF MELVILLE SHOE CORPORATION SAFETY SHOES

Thom McAn Safety Shoe Division
25 W. 43 St., N. Y. 36
Gentlemen: Please send me the following at once:
(Check service required)
☐ Details of Thom McAn's sales plans
☐ Illustrated list of Thom McAn Safety Shoes
☐ Set of safety posters

NAME	POSITION
FIRM	
ADDRESS	
CITY	ZONE STATE N



ACCO X-WELD ACID PICKLE CHAIN

—a chain so tough hot acid can't hurt it!

This new chain resists the destructive effects of both heat and corrosion in normal sulphuric acid pickling operations. It can be used successfully in concentrations of sulphuric acid up to 20%, and at temperatures up to 200°F. Made in ACCO's famed X-Weld design, this new chain has welds that are as strong or stronger than the chain itself.

Under comparison tests, ACCO X-Weld Acid Pickle Chain has proved equal or superior to higher priced non-ferrous chain. In addition, the high alloy content makes it suitable for use in

annealing furnaces at temperatures up to 1700°F without scaling or without losing its acid-resistant properties. When subjected to elevated temperatures, full working load limit of Acco Pickle Chain is restored when chain is returned to room temperature.

...

Acco X-Weld Pickle Chain is available now in five sizes ($\frac{9}{16}$ " to $\frac{3}{4}$ ") for assembly in ACCO Registered Sling Chains. For information, write our York, Pa., office for Bulletin DH-169.

ACCO ACCO Registered® SLING CHAINS



American Chain Division • American Chain & Cable Company, Inc.

Bridgeport, Conn. Factories: *York and *Braddock, Pa., *San Francisco, Calif.

Sales Offices: *Atlanta, Boston, *Chicago, *Denver, Detroit, *Houston, *Los Angeles, New York, Philadelphia, Pittsburgh, *Portland, Ore., *San Francisco

*Indicates Warehouse Stocks

CONSULTATION CORNER



Questions on accident prevention, fire protection and occupational hygiene are answered by mail. A few are selected for publication

By L. C. SMITH, Industrial Department, NSC

Flammability of Insulated Underwear

Question: We heard of an incident where a welder, wearing the blanket stitched type insulated underwear, was severely burned when a spark ignited his underwear and it burst into flame.

The burning garment was pulled from the worker's body by other workers. However, the residue of melted material, left after the burning, adhered to his skin and caused portions of the skin to pulled away with the garment.

Do you have any information that would be of help in situations of this type, since we have a number of men wearing underwear similar to that of the injured man.

Answer: This subject currently is receiving a great deal of attention, as there have been several such cases reported. In one instance, almost identical in nature to the one you reported, the worker was rolled in a blanket to smother the flames. However, the intense heat retained by the residue of melted material caused severe burns to the victim.

Synthetic materials are no more combustible than cotton. This is the opinion of several large manufacturers who have conducted extensive tests. Synthetics ignite at fairly low temperatures and the burning results in a rapid melting.

This melted material tends to form a covering which holds the heat in, much like foil wrapped around a baked potato. Naturally, burns are severe and when the garment is in direct contact with the skin it adheres to the skin. Garments with a cotton lining will prevent this effect.

In purchasing insulated underwear, make certain it does not have a synthetic material for the inner lining. Also, avoid any cheap underwear in which insulation is composed of a loose type of filling cov-

ered with material containing a heavy nap. These burn readily.

If you are purchasing for your employees, it would be wise to test the flammability of the garments. This can be easily done by applying a match or a small torch. It is a good idea to instruct your employees to wear hard-finished cotton, wool or leather outer garments over the insulated underwear. It is also desirable to instruct them to wear woolen or cotton underwear next to the skin.

Welding LP-Gas Fuel Containers

Question: Some tanks on our LP-Gas industrial trucks have leaks. We have several welders we feel are

fully qualified to weld these tanks. What precautions would you recommend in such welding?

Answer: Welding may be done on the saddle plates, lugs or brackets originally attached to the container by the manufacturer—but not on the fuel container proper.

Fixed fuel containers for LP-Gas industrial trucks should be pressure vessels constructed, tested and marked in accordance with the ASME Unfired Pressure Vessel Code. Removable fuel containers should be ICC containers for LP-Gas service or ASME pressure vessels.

ASME containers should be marked with the ASME "U" symbol and the design working pressure.

ICC containers should have the marking ICC-4B240 or ICC-4BA240.

It is recommended you check all of your fuel containers to make certain they are of approved types. Any containers not properly marked as outlined previously or any leaking containers should be replaced by approved types. Your own welders should not make any attempt to repair these containers.



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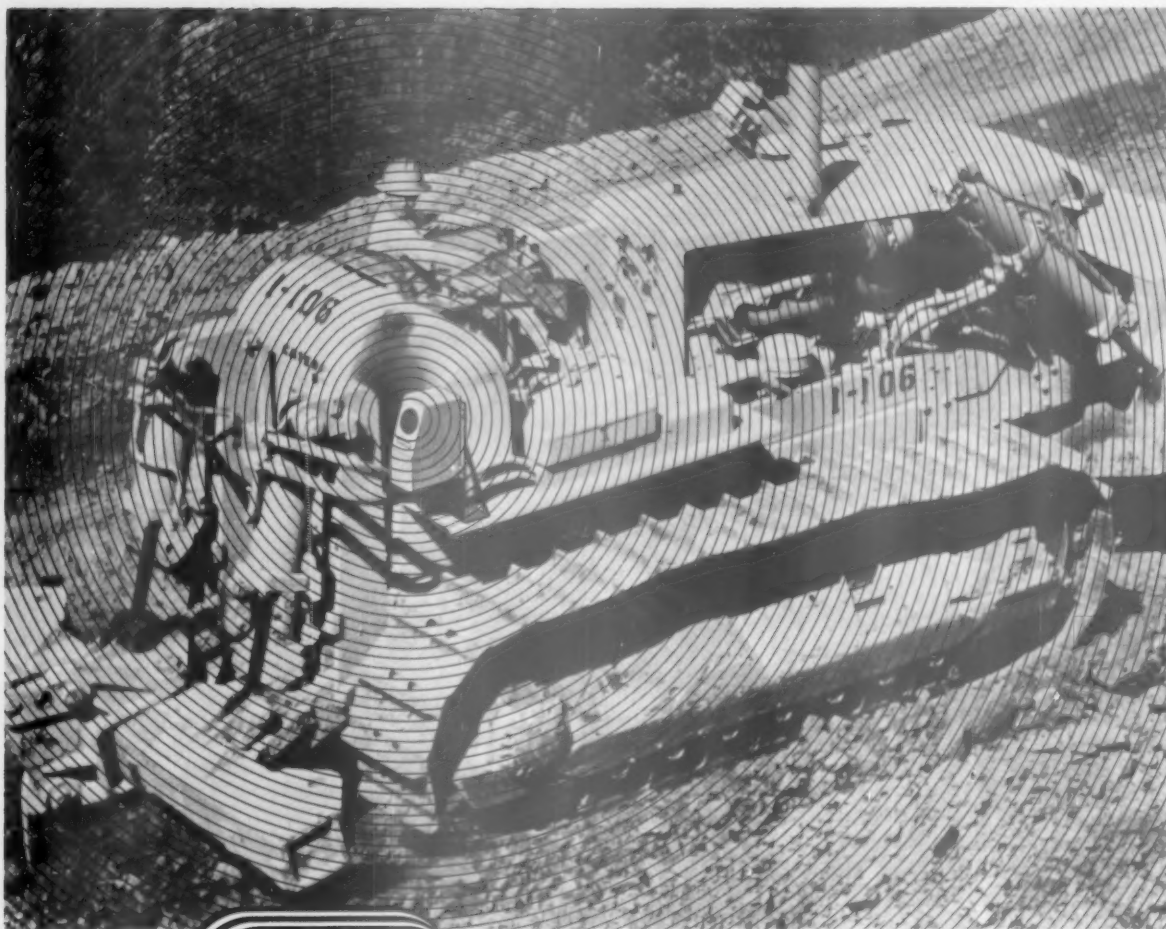
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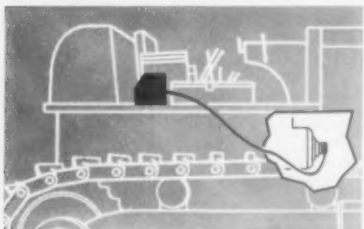


BULL/HORN REVERSE ALARM



(A) Over-running clutch operates air pump and horn equally well whether pinion shaft rotates clockwise or counter-clockwise.

(B) Flexible drive cable transmits power from gear box on front of transmission case to sound unit at rear of vehicle.



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National Safety News, February, 1961



The Journal

**TECHNICAL
FEATURE
SECTION**

**OF THE
AMERICAN
SOCIETY
OF
SAFETY
ENGINEERS**

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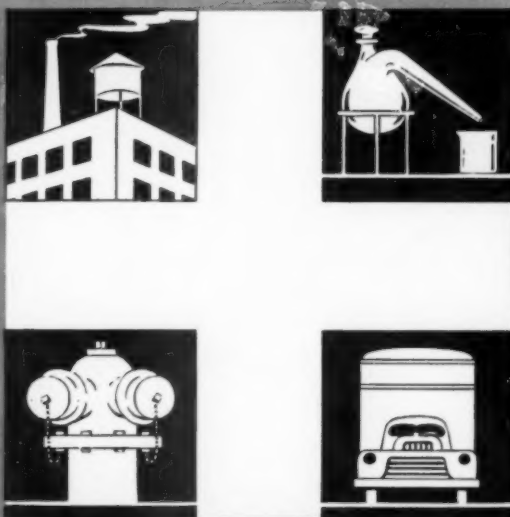
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FEBRUARY, 1961

Journal Presents 3 Winners Of Technical Paper Awards

■ IN THIS ISSUE, the *Journal* is proud to present three of the five Technical Paper Award winners for 1960. Winners of the second presentation of these awards, co-sponsored by the Veterans of Safety and the American Society of Safety Engineers, were announced October 18, 1960 at the Society's Awards Luncheon in Chicago.

On page 2 is the first place winner — "The Personal Touch" by Robert D. Gidel, an article written in the now famous "gone" style created by its author.

The next two articles are "Safety — Its Relation to Cost and Production" by Albert L. Anthony, and "How Much Safety Factor?" by Robert F. Schoof, both winners of Honorable Mention.

Mr. Anthony's article focuses attention on both the direct and indirect costs of accidents, with detailed scrutiny of the so-called hidden costs as related to production. Mr. Schoof's article deals with the technical problems of engineering design as they are affected by established standards, efficiency and safety factors.

■ The influence of the *Journal* and the far reaches of the earth to which this influence spreads is never better illustrated than this case which came to our attention recently. In the July, 1960 issue of *Safety Engineering*, published by the Safety Engineering Society of Australia, an article which originally appeared in the *Journal* — "The Most Misunderstood Subject in Accident Prevention" by Merrill C. M. Pollard — was reprinted in its entirety for the benefit of the safety engineer "down under." — the Editor.

AMERICAN SOCIETY OF SAFETY ENGINEERS

Organized 1911 — Chartered 1915

5 North Wabash Avenue, Chicago 2, Ill.

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managing director

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editor

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Opinions expressed in articles published in the Journal are those of the authors and are not necessarily endorsed by the American Society of Safety Engineers.

OUR PRESIDENT SPEAKS ON SAFETY

IT WAS MY PLEASURE recently to present a charter to the 76th Chapter of the Society, the Mississippi Chapter. The occasion was a most enjoyable one, and I left Jackson, Mississippi, with a warm regard for the famed southern hospitality which was so generously shown.

In presenting the charter to the Mississippi Chapter, I briefly outlined the growth of the Society from 35 members in 1911 to 7,300 in 1960. Our rate of growth up to 1947, when we became an independent organization, averaged about 100 members per year and our membership totaled 3,900. From 1947 to 1960, our increase in membership averaged 270 per year, although the growth annually tapered off in the latter years until we actually showed a decrease in membership of 40 in the year from September 30, 1959, to September 30, 1960.

Does this leveling off and reversal in growth mean that we have "topped out?" Have we reached the saturation point? Do we now have in the Society all of the qualified people in safety? Our temporary stall may be a repercussion of the Society's dues increase or a reflection of business conditions or a combination of both. Our long-range outlook, however, must be good, since industry's continual expansion constantly creates positions for safety engineers.

One of the reasons convincing me that our Society has not reached a saturation point where we can feel that most all of the qualified safety engineers are members, is the experience of the Greater Chicago Chapter with a membership drive it conducted three years ago. By a well-organized, concerted campaign, this chapter increased its membership by approximately 100, or a 33 per cent rise in one year. If you wish complete details on this campaign, our Managing Director, Al Blackman, will be happy to furnish them.

The Greater Chicago Chapter's success with their membership drive is significant. It would indicate that there are a great many people in safety who could be encouraged to become members of our Society if an effort was made to acquaint them with the objectives of the Society and the benefits of membership in it.

What has your chapter done about trying to increase its membership? Has it promoted a membership drive? Has it developed a list of all of the potential members in its area? There are a number of sources available to assist in creating such a list.

Chapter members engaged in selling safety protective equipment, for example, could provide a fairly complete list of safety engineers in a chapter area from their customer contacts. Local safety councils, chambers of commerce, state industry associations are also good sources of prospective members.

Once you have completed a list, a plan of action should be decided upon to interest non-members in the Society. This could be done by mail, telephone, friends or a Society guest night meeting. The national office has brochure material available which outlines the Society's objectives and a set of slides describing A.S.S.E. activities.

There is no reason why our Society should not show a steady growth. The Committee on Membership is responsible for the investigation and development of means to increase membership, but the problem is essentially one which must be solved at the "grass roots" level — the chapters.

George L. Gorbelle

GEORGE L. GORBELL, PRESIDENT
AMERICAN SOCIETY OF SAFETY ENGINEERS

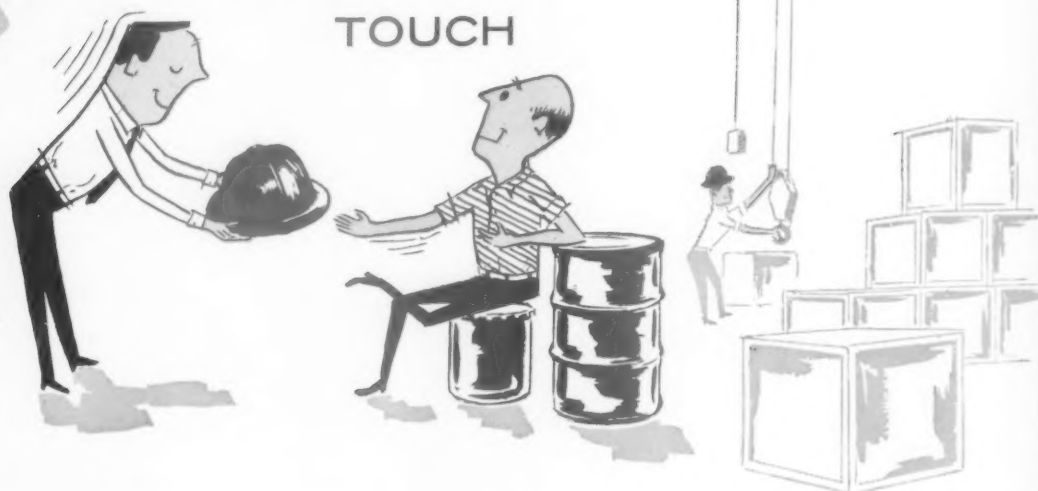


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The Personal TOUCH

BY ROBERT D. GIDEL



ALTHOUGH MANY safety administrators, consultants and engineers think the foundation of their continued existence rests on their abilities to deal with technical matters, none of them are really cutting the mustard up to expectation unless they use "The Personal Touch." That is, "The Personal Touch" as it relates to every direction they turn in their business and professional lives.

At first blush, this may sound like a pat phrase or slogan drafted from the Madison Ave. garbage heap. Come again please, and let's go in the back door and really see how the situation stacks up inside.

Our problem these days isn't that we don't know how to prevent accidents. We have the technical know-how, the recording procedures, the investigative systems, the training techniques and the supervisory skills. We have the means for providing mechanical safeguards and all sorts of personal protective equipment and devices. We have ways of determining the toxic limits for hazardous materials and we know how to set up controls to cover most any situation. What we don't know, or practice, is the way to *personalize* the skills, knowledge and resources we have to the job of preventing accidents.

The skill of personalizing is an absolute necessity if we expect to ride herd on the changes and advances of our dynamic society and keep pace with our competitors. We must compete for men's minds

and reason, and we must personalize our pitch in order to attract our share of his attention which is diluted by other personal interests such as high taxes, poisoned cranberries, unruly kids, traffic snarls, payola, the high cost of living and possibly a mother-in-law.

We must personalize to what's bothering man currently, or else it's like making love to a woman in a dead faint. There's just no response.

We have at least three basic personalizing problems to lick if we expect to stay out of the unemployment insurance lineup:

1. How can we personalize ourselves to the times?
2. How can we compete with diversionary elements personalizing safety to the individual?
3. How can we personalize safety to management and convince it that safety is not merely a luxury which can be afforded in a boom but can be forgotten when things slow down?

There are eight areas of personalization for us to consider if we are really to be successful in our job.



Robert D. Gidel is assistant director for safety of the Bureau of Labor Standards, U.S. Department of Labor. He holds a BS degree in industrial engineering from Washington University and a bachelor of laws degree from John Marshall Law School. He joined our Society in 1952 and this is his first article to appear in the Journal.

They can be considered in the aggregate as constituting our necessary sphere of personal give and take.

We must:

- Personalize to the Times
- Personalize to the Boss
- Personalize to the Employee
- Personalize to the Job
- Personalize to the Family
- Personalize to the Community
- Personalize to the Union
- Personalize to our own Responsibilities

THE TIMES

Ours is a dynamic age. Changes in thinking, techniques and technology are constant and fluid. There is no place in the scheme of things for the inflexible stick-in-the-mud. Our terminology, our topics of conversation, our interests, our objectives, our ways and means of achieving goals vary by the week. Sometimes, and in some areas, by the hour.

If we expect to deal with the people who make up this nervous sea of progress and civilization we must constantly be at the lip of the tide in order to seek out and evaluate. There is no quarter for those steeped in the philosophy of yesterday, or why we used to do it that-a-way.

There are strong forces running, and it is up to us to appraise and harness those which can help us. By the same token we must close the door on misguided, misconceived action which will do harm. We can't throttle progress because it may be dangerous, but we can help channel it into control paths.

Some ways to personalize to the times include:

- Keep abreast of the philosophies, fears, hopes, tempos, and cathartics currently circulating.
- Consider how points can be made by harnessing or yoking them. A point a day may keep the devil away from someone.
- Keep in touch with new methods and materials which might be put into action and create new hazards and problems for your own boys. Don't wait till they're all set up.
- Keep your mind and methods open. Flush regularly.
- Participate in planning and programming new projects in or outside the company.

THE BOSS

If we are to convince production-minded, cost-conscious management that we are more than ersatz professionals we must display at least a working knowledge of modern production techniques and principles of management. These include a working knowledge of:

1. Human psychology
2. Personnel selection and placement
3. Job and methods analysis
4. Supervisory skills
5. Training techniques
6. Scheduling and planning
7. Quality control
8. Cost analysis
9. The physical sciences
10. Inspection and evaluation
11. Investigative procedures and techniques
12. Records and reports
13. Maintenance schedules and procedures
14. Layout and arrangement
15. Research, design and development
16. Specifications and standards
17. Materials handling methods
18. Process and materials flow

How much do you know about each of these subjects areas? Are you on a working acquaintanceship with them? Should you be? To help the boss appreciate the need for safety activities, do you translate the results of your programs into his language? For some ideas, see *Exhibit A*.

Is it wise to submit frequency and severity figures to the boss? Should he be given a list of things called temporary totals, permanent partials, permanent totals? What do they mean to the boss? Are these just specialties of the trade? Are we just trying to force him into our mold?

I suggest all such data should be compiled, then translated before it goes to him, stating such things as:

- *Down-time* directly connected with accidents amounted to blank hours constituting blank cost.
- *Delays* caused by accidents constituted blank hours costing blank dollars.
- *Scrap or Rework* resulting from accidents cost blank dollars.
- *Lost Production Time* due to employees being treated for minor injuries amounted to blank hours costing blank dollars.
- *Hiring and Training* expenses in replacing injured employees amounted to blank dollars.
- *Fill in* the other pertinent cost personalizations for your organization.

These suggestions aren't new. If we want the boss to feel that we are in on the act we must relate to his interests and responsibilities, use the language and terms he appreciates, translate program activities into production improvements and reductions in costs, prepare data in "quick-to-assimilate" form so as not to waste his time, keep him informed and make him the front man.

THE EMPLOYEE

Like the man who had to hit the mule over the head first to get his attention, we have to be current, dynamic and interesting in order to get our share of the modern man's mind. This takes imagination, ingenuity and talent. We must be flexible in our attitudes, and possess the skill of changing pace. Keep 'em off balance so they can't get in a rut. We have to:

- Relate to interests, hopes, desires, pocketbooks
- Tie in with current events, local problems and current activities
- Change the pace periodically, inject humor
- Consider local loyalties and prejudices
- Relate to philosophy, environment and background of the work force
- Work in incentives, personal recognition
- Publicize

THE JOB

We can't make a job safe unless we know what duties and elements make up the job. We can't select, place, or train a safe worker for a job unless we know the skills, knowledges and physical requirements for it. To personalize safety to the job we must:

- Prepare a step by step analysis of each job element
- Draw up qualification requirements for each job to guide selection and placement of personnel
- Compile injury data to pinpoint problem jobs
- Analyze layout, flow and methods
- Provide physical and mechanical controls
- Provide chemical and environmental controls

THE UNION

Organized labor is one of the few remaining groups whose potential for supporting safety has not yet been fully utilized. If we expect to make further substantial reductions in the total number of occupational injuries occurring each year, labor must be brought in on the act and required to accept responsibilities to work for the welfare of union members. If we properly personalize our needs to the union, it can supplement our appeals to the employee, as his recognized representative body.

There are several ways to personalize to the union and solicit its cooperation and support.

- Educate union officials on the safety program, its problems, its needs, its technicalities.
- Urge union officials to set up a safety committee within the union — help them program the committee meetings.
- Provide union representation on company safety committees.

- Promote the philosophy of self-discipline, cooperation.
- Promote safety as a conservation service to the members.
- Publicize economics of being injured.

THE FAMILY

The power and influence of the American housewife and Mother should never be underestimated. If we can get Ma on our side, Dad will have some safety supervision at home and while driving with the family on the road. Since Dad is just as absent from the job if he's injured away from it, all the cooperation we can get from the home front should be solicited and welcomed. Ways to personalize to the family include:

- Show family where Dad works — tours of plant
- Arrange family picnics, dinner, parties
- Have family competition for prizes, awards, recognition
- Put Ma on mailing list for all safety publications, campaigns and promotions — particularly holidays, long weekends
- Form women's safety auxiliary
- Compile and publicize data on off-job injuries — distribute causes and corrective measures

THE COMMUNITY

The interests and well being of the work force of any organization are necessarily related to the interests of the community. Since many organizations still do not have full time safety staffs, community safety activities sponsored or supported by those who do can have a beneficial effect on the public not exposed to safety education and supervision on the job. Besides the public and community relations aspects of such activities, the lives you save may be those of some of your most valued employees, who would otherwise be run over or hurt by their neighbors.

Since safety these days is a 24-hour-a-day, 7-day-a-week business, the more you can get other elements in the community talking safety the better control of the odds you'll have.

You can:

- Tie in with local events, holidays, programs
- Form community committees, support them.
- Utilize community specialists for company purposes (firemen, police, other specialists). Form a "Share the Safety Wealth" campaign.
- Help arrange first aid, driving, swimming, fire-arms, and supervisory training.
- Initiate community campaigns, slogans, contests, awards.
- Key programs to inherent hazards of the area — water, hunting, traffic, sports.

YOUR RESPONSIBILITIES

Do you ever sit down a few moments and cogitate on what you represent, what you are responsible for, what your influence is, and what your objectives are? Do you have a dynamic program or a routine one? Are you bored with your job, or do you come to it each morning with a sense of eagerness and a zeal for tackling new and varied matters that are there if you only seek them? If you're a bored, routine type safetyman, Mac, you just ain't trying!

To personalize yourself more to your own job responsibilities you can do a number of things:

- Get off your seat and mix
- Periodically reappraise your goals, objectives, methods
- Continually update technology, techniques — periodically ask yourself, "Can I jump on top of any situation I may be required to handle"
- Compartmentalize your problems by analysis and classification
- Organize statistics and data collection systems to point up problems — don't force problems to fit a system
- Change systems, procedures and pace periodically

- Assign priorities
- Learn to know the work force, the boss, the work environment — map out best strategy and techniques for dealing with each
- Don't blindly adopt other programs, ratios, data and measures as your own — personalize your program to your problems

This treatise is not meant to mean that safety jobs can be turned over lock, stock and barrel to the personality boys, head shrinkers and paper shufflers. Such lots couldn't do a well-rounded safety job any better than a hot shot technician or scientist would do by waving a slip-stick around and quoting formulas and equations. The guy who'll cut the cake and get the piece with the thickest layer of frosting is the one who can play footsy with those 18 items listed previously herein and generate the where-with-all to carry them off. There's no one way to do this, and each to his own, as long as he gets results.

No matter whether you're peddling brassieres to Fiji Islanders or goggles to steel burners, you have to be ready with an answer to, "What's in it for me?"

EXHIBIT A

BENEFITS FROM SAFETY PROGRAM ACTIVITIES

PERSONNEL BENEFITS

1. **SKILLED MANPOWER IS CONSERVED**
(by safety training, reducing injuries)
2. **A BETTER CLASS OF EMPLOYEES IS ATTRACTED**
(better working conditions, reputation for safety)
3. **QUALITY OF SUPERVISION IS IMPROVED**
(considers all production hindrances, safety training)
4. **TURNOVER AND ABSENTEEISM IS REDUCED**
(better morale, attitudes, improved working conditions, training, fewer accidents)
5. **EMPLOYEE SKILLS ARE BETTER UTILIZED**
(jobs analyzed for safety and efficiency, training, preplacement testing)
6. **NEW EMPLOYEES REACH PEAK EFFICIENCY SOONER**
(better training, better supervision, job studies)
7. **OVERALL MORALE IS IMPROVED**
(better environment, better employee relations, better supervision, develops cooperative spirit)
8. **LABOR-MANAGEMENT RELATIONS ARE IMPROVED**
(fewer grievances, better cooperation, workers better educated and indoctrinated)

PRODUCTION BENEFITS

1. **DOWN-TIME OF PRODUCTION MACHINERY IS REDUCED**
(fewer injured operators, better trained operators, better maintenance)
2. **SET-UP TIME IS REDUCED**
(better trained, job methods are analyzed)
3. **STIMULATES SUGGESTIONS FOR MORE EFFICIENT OPERATIONS**
(inspection activities, investigation of injuries, safety committee review)
4. **SAVINGS ON MATERIALS**
(less damaged in accidents, ventilation collection, selection of least hazardous, consider best and safest processing methods)
5. **PRODUCTION PLANNING AND SCHEDULING IS IMPROVED**
(fewer production workers absent due to injuries, studies for best and safest methods, methods of handling, flow of materials, limits bottlenecks)
6. **MAINTENANCE COSTS ARE REDUCED**
(regular inspections, better training of operators, better selection of tools and equipment)
7. **HANDLING OF MATERIALS IS SIMPLIFIED**
(find best and safest way, flow studies, mechanization)
8. **SCRAP IS REDUCED**
(better trained workers, tools, equipment and methods better selected, improved handling)
9. **PHYSICAL PLANT IS CONSERVED**
(regular inspections, study maintenance schedules, and methods)
10. **PUBLIC AND COMMUNITY RELATIONS ARE IMPROVED**
(employees spread word of good workplace, families participate in activities in and out of plant)
11. **CUSTOMER GOODWILL IS PROMOTED**
(prompt job completion, reliable quality, dependable service)
12. **QUALITY CONTROL IS IMPROVED**
(better trained workers, more interest, better cooperation, using best methods and tools)
13. **PRODUCTIVE TIME LOST DUE TO OFF-THE-JOB ACCIDENTS IS REDUCED**
(safety training on the job carries over, aids community programs)
14. **PRODUCTIVE EFFECTIVENESS OF SUPERVISION AND WORK FORCE IS IMPROVED**
(training, better class workers, better working conditions, increased cooperation)
15. **PRODUCTION IS INCREASED BY REMOVING FEAR FACTOR**
(guards, controls, protective clothing)
16. **LESS CHANCE FOR CATASTROPHES**
(better inspection, maintenance, using less hazardous materials or processes)

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Safety

—its relation to cost and production

IT IS GENERALLY recognized that safety has an effect on the cost of an industrial operation. Yet many persons, even in the safety profession are not truly aware of the far reaching effect it has. It is a subject which needs more advertising, if you will.

Recently, I had an opportunity to hear a debate on whether salesmanship was the most important requisite in the profession of safety, or not. As is the case with most debates, the only conclusion drawn was what remained in the minds of the audience, so there was no simple answer to the question. It was unanimously agreed, however, that without salesmanship, the best safety program, or the best safety solution to any given problem, might never be accepted.

My object here is to assemble some material to demonstrate that a definite relationship exists between safety, cost, and production. This material can then be used in developing advertising and sales approaches to convince others of what we already know.

The other day a friend was telling me of some experiences his son had during acceptance tests and interviews for entrance at a State Teachers College.

A question on the application form asked: *Mother's occupation*. One of the boys thought to himself, "My mother sews," so he filled in the question: "Sewer." Later, when he was being interviewed, the teacher reached this part, and looked up at the boy, saying: "Your mother works in a sewer?"

by ALBERT L. ANTHONY

Another of the boys whose name was Jimmy Kubaczyk went to the interviewer's desk when it was his turn, and gave the teacher his application. The teacher looked at it, and then said: "How do you pronounce your name?" Jimmy immediately replied: "James."

It is obvious that there was a lack of communication here; but also, if you put yourself in the boys' positions, there was considerable nervous tension. This tension was occasioned by a new experience, and a strong desire to make good.

Some form of this nervous tension, coupled with a desire to make good affects all of us in everything we do. And each of us can recall an experience in our lives where we have misunderstood a seemingly simple question, or in turn have been misunderstood.

Thinking back to those days when we were about to graduate from school and face life as an adult for the first time, it is not difficult to recall the feelings of confusion and uncertainty which existed.

In developing our subject, we want to avoid any confusion in arriving at a conclusion. To do this, we shall start with the fundamental concept of "Who Pays for the Cost of an Accident."

There are two costs involved in any personal injury accident — the direct cost, and the indirect cost. The direct cost is also known as the "insured" cost. For our purposes, this can be considered as the amount of money paid to injured employees for workmen's compensation benefits as established by State law, plus the cost of medical treatment.

The indirect cost, which can also be called the "uninsured" cost, may be, and usually is greater than the direct cost. It is "hidden" or "incidental" and thus indirect, because much of it cannot be easily determined in dollars and cents.

Many years ago a study was made which revealed that on national averages, the indirect costs are four times greater than the direct costs. In re-

Albert L. Anthony, service representative for the Loss Prevention Dept., Liberty Mutual Insurance Co., has been a Society member since 1951. He is currently general chairman of the New Jersey Chapter. Mr. Anthony has been with Liberty Mutual for more than 10 years and holds a BS degree from Brown University. This is his first paper published in the Journal.



cent years, there have been articles in trade journals which indicate that this four times factor may no longer be true. They indicate that in most cases, this figure is conservative.

Safety men who have made studies of their operations have stated that this factor is now between seven and fourteen times greater than the direct costs. This becomes a very significant cost of operation, and one which can easily be overlooked unless safety accepts its responsibility to make it recognized.

What are these indirect costs? They include many things such as:

1. *Production Time Lost by an Injured Employee:* This can cover wages paid him for time spent in getting first aid; for time not worked that day if he does not return to work; for poor quality or less work when he does return to work.
2. *Time Lost by Supervisors:* The time spent in seeing that the injured employee is taken care of; in investigating the circumstances of the accident; in rearranging the production schedule; in making a report of the accident.
3. *Time Lost in Repairing, Replacing, Clearing Away, Rearranging or Cleaning Up* equipment or material that was damaged or disarranged by the accident.
4. *Production Time and Product Lost* if a machine is shut down or a continuous process halted.
5. *Production Time and Product Lost* by other employees near or at the scene of the accident.
6. *Cost of overtime wages* to make up lost production.
7. *Cost of Material Spoiled or Reprocessing of Product or Material Damaged* by the accident or by a substitute employee.
8. *Cost of Transferring or Hiring and Re-Training or Training of Substitute Employee* in temporarily accepting less quantity and quality of production from him.
9. *Cost of on-the-job First Aid.*
10. *Miscellaneous or Unusual Costs* such as renting of replacement equipment, loss of profit on con-

tracts cancelled, customer good-will on late deliveries, etc.

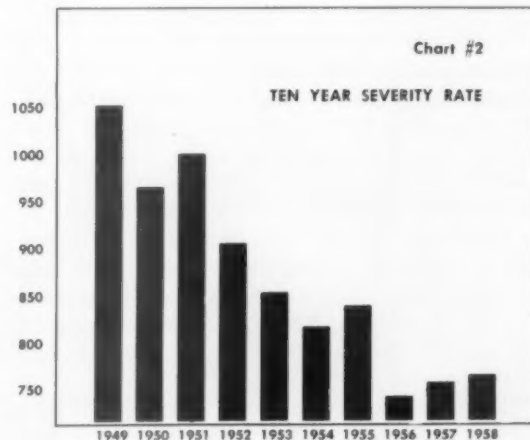
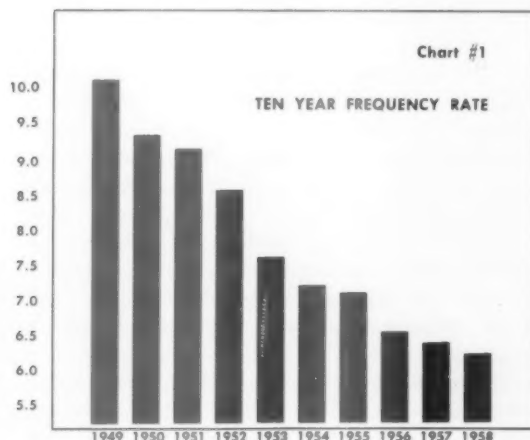
It should now be apparent that the company pays the cost of the accidents, both the direct and indirect costs in the final dollars and cents. Perhaps less apparent, but equally true is the fact that the immediate supervisor also pays the cost. His performance efficiency cannot help but suffer with the added burden of the various factors involved. And the injured man himself pays in the same manner as any accidentally injured person does.

WHO PAYS FOR ACCIDENTS?

There is a fallacy in the minds of many people even today as to who pays for accidents. Each of you has heard the statement: "Oh, it doesn't cost me anything, I'm insured." True, the money allocated to insurance, in the form of premiums, provides the dollars and cents to pay for claims. But these premiums must also pay for administrative expense over and above claim losses. There are also such other things as experience modification factors, base rate development, and expense constants which determine premiums. The end result is that eventually any company, except very small ones, will pay in actual dollars, the full cost of their own experience.

We have now established a common base for understanding where the money comes from to pay for accidents. Now, let us examine some additional background which is important to developing a conclusion about the relation of safety to cost and production.

The American Standards Association Code Z16.1 is the universally accepted method for recording and measuring work injury experience. This has a purpose and answers the need to provide a means of



comparison between companies, locations, industries, or any other grouping desired. Most of us are also aware of the criticisms which have been made of this code in recent years.

During the past year an article was published in the JOURNAL OF THE AMERICAN SOCIETY OF SAFETY ENGINEERS to the effect that the true meaning of frequency and severity data is known mainly to safety people themselves. Perhaps the data means something to us but it has been my own experience that all too often the people to whom these rates are presented do not fully comprehend their meaning. Many times these figures do not correlate with the financial reports.

However, this data is still the accepted yardstick, and offers us a convenient take-off reference point.

10-YEAR FREQUENCY, SEVERITY RATES

On chart #1 is demonstrated a ten year trend of all industry frequency rates.¹ The steady downward trend is quite apparent.

The trend on chart #2 which shows the severity rates¹ for the same period is not as pronounced, but still is essentially downward.

Recognizing the ten years shown on these charts, the period of 1949 to 1958, we are all very much aware that the economic trend during this period had been rising. We are also aware that the various Workmen's Compensation laws during this period have tended to liberalize benefits, and to include a greater scope of conditions than they once covered.

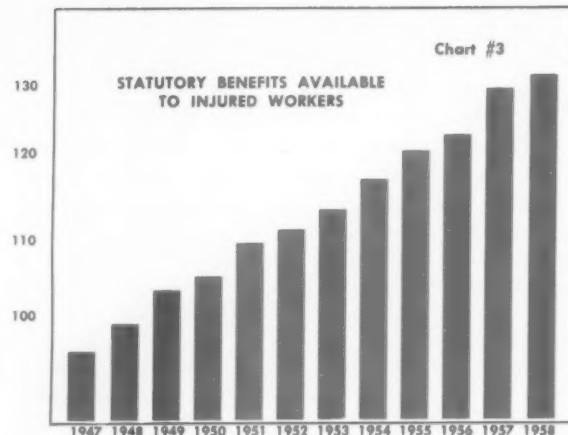
To demonstrate the Compensation benefit trend during the same ten year period, we have taken a weighted nationwide average of benefits available under the Workmen's Compensation acts for the three years 1947 through 1949 as a base point called 100%.

INCREASE IN WORKMEN'S COMPENSATION

Chart #3 shows the percent increase for each of the succeeding years.² This demonstrates a significant rising trend and is nearly 29% higher by 1958.

What does this mean to us? Simply that each industrial personal injury which occurs can be expected to have a greater severity today, in terms of economic loss, than the same injury would have had one, two, five, or ten years ago. It also means that the relationship which existed between Compensation benefits and the American Standards Association schedule charges 5 to 10 years ago, no longer holds true.

A comparison of these three charts also reveals another significant fact. During the ten year period



in which the safety movement can take great pride in its accomplishments, according to the accepted standard of measuring performance, an increasingly greater pressure has been affecting the economic results of injuries which still occur.

The next fact is vital to a full recognition of the relationship safety holds to cost and production. Zero or low American Standards Association frequency and severity rates do not mean zero or low economic accident losses to our company. The use of the word accident in this instance would be the definition used in the determination of compensability under a specific Workmen's Compensation Act.

ACHIEVEMENTS WORTHWHILE

It should be made clear that it is not my intent in any way to detract from the various contests run by different agencies, nor from achievements earned in accordance with the ASA code. They are worthwhile, they do serve a purpose, and they remain worthy of all the commendation they receive.

There is a need, however, to recognize the difference between these achievements and the financial results occurring under Workmen's Compensation coverage.

This difference which has been demonstrated between the accepted method for compiling work injury statistics, and the economic results achieved by any particular company, plant, location, or other desired unit for measurement has been gaining recognition in recent years. It is vital to the future role of the safety profession that its full significance be understood.

We have referred to the safety profession, and the title of the subject is *safety*. Many of the individuals practicing the profession are known as safety engi-

neers. None of these titles, however, give any definition of the responsibility. What are the safety engineer's responsibilities?

A review of the safety engineering profession reveals that in its earliest stages, safety engineering was primarily concerned with the correction of physical hazards, with the additional refinement of employee safety training. These are fundamentals which must be continued, making sure they are updated with the advances of industry.

Under these old concepts where the primary function of the safety program was to reduce lost time accidents, the familiar ASA code reflected the job performance.

But is this the only responsibility the profession has? Definitely not! There is a responsibility to prevent loss. As was established earlier, personal injury accidents result in economic loss far out of proportion to the direct cost involved. By the same token, accidents which do not result in personal injury can also cause serious economic loss. This, too, is a part of the problem an effective safety program seeks to control.

On the basis that all injuries cost something even when a single treatment for first aid is all that may be needed, some companies have made use of a frequency rate for total injuries, as distinguished from lost-time cases only.

Chart #4

TOTAL ACCIDENT FREQUENCY	
A.S.A. FREQ.	T.A. FREQ.
2.79	1293
2.73	1775
2.65	2106
$T.A.F. = \frac{\text{ALL ACCIDENTS REPORTING FOR FIRST AID OR MORE SERIOUS MEDICAL ATTENTION}}{\text{TOTAL MANHOURS WORKED}} \times 1,000,000$	

On chart #4 the difference between the total accident frequency and the ASA frequency for a three-year period is shown. The values can be seen as 2.79, 2.73, and 2.65 compared to 1293, 1775, and 2106 respectively. At a rate of \$3.30 per in-plant medical treatment, they represent from a little over \$4,000 per million manhours to slightly less than \$7,000 per million manhours worked.

This frequency necessarily includes all those accidents chargeable under the ASA code, and also includes all those incidents previously referred to as occurring during lost-time accident free periods under the ASA code.

Chart #5

COMPENSABLE ACCIDENT FREQUENCY	
A.S.A. FREQ.	COMP. FREQ.
2.73	21.43
2.65	20.66
$COMP. FREQ. = \frac{\text{ACCIDENTS REPORTED UNDER WORKMAN'S COMPENSATION LAW}}{\text{TOTAL MANHOURS WORKED}} \times 1,000,000$	

It is true that this system does not reflect the economic results of serious injuries, such as amputations, but it does yield some measure of performance.

Another idea which has been tried with some success has been called Compensable Accident Frequency and Severity. It is patterned on the familiar ASA code, but measures the frequency of all claims reported under the Workmen's Compensation Act, regardless of any concern as to whether they were chargeable accidents under the ASA code or not.

In chart #5 is shown a two-year comparison of the ASA frequency and the Compensable frequency. It will be noted that in this example the Compensable frequency ran about eight times greater than the ASA with rates of 21.43 and 20.66 comparing with 2.73 and 2.65.

The Compensable Severity rate requires a little more calculation. It was determined by applying the indicated percentage of disability provided by medical opinion to the Workmen's Compensation Law schedule and arriving at a number of days. The actual days lost, or this percentage value, whichever was greater, was the number of days charged in the formula. As a matter of interest, the percentage figure usually dominated.

In chart #6 the two-year comparisons of these severity rates are shown. It can be seen that the Compensable Severity rates of 2953 and 2291 compare to ASA rates of 322 and 323.

Although the estimates used to develop these rates were necessarily very "green" or immature in

Chart #6

COMPENSABLE ACCIDENT SEVERITY	
A.S.A. SEV.	COMP. SEV.
322	2953
323	2291
$COMP. SEV. = \frac{\text{DISABILITY PERCENTAGES PROVIDED BY MEDICAL OPINION IN TERMS OF DAYS, OR ACTUAL DAYS LOST}}{\text{TOTAL MANHOURS WORKED}} \times 1,000,000$	

order to keep them reasonably current, they still yield a comparative trend picture in terms of anticipated economic results.

The Compensable Accident Frequency and Severity rates would reflect all the various types of injuries reviewed earlier as examples of the economic loss not reflected in the zero ASA rates.

Another idea which provides a tool for keeping currently aware of the economic trend involves using the total value of all compensation claims each month against a manhour base. Again, it is necessary to use very "green" reserve values. By utilizing twelve month moving average rates, some of the bumps can be smoothed out, and a trend line established to show whether experience is improving or becoming poorer.

COMPENSATION RATE INDEX

A formula for this, which has arbitrarily been called a Compensation Rate Index is shown on chart #7. The choice of the manhour base is not of particular significance.

One thousand was selected in this formula as it results in dollar values for the graph. Two thousand might be a good base, as this would yield an approximate cost per employee per year. This would make a good reference point for management in understanding the magnitude of the problem. This method, however, yields only a measure of the economic severity without regard to any frequency.

It has now been developed that all accidents cost money, and that further, the major portion of this money is paid by the company. But where does this money come from? It comes from production since no entity can remain in business unless it produces something for income. In this case even service organizations produce something since they sell their services.

This means that safety has a very vital relationship to cost and production. Now what can safety do about it?

PROVIDE MANAGEMENT WITH LOSS DATA

We have determined that economic loss does not necessarily parallel our accepted method for evaluating safety performance. In matter of fact, it frequently exceeds our yardstick. Thus, it is important that safety assume the responsibility to make certain that management is provided with loss data covering both direct and, at least estimated, indirect costs.

Assuming that this loss data is provided, it should be safety's responsibility to analyze the data, and to make recommendations concerning it.

Chart #7

COMPENSATION RATE INDEX

$$\text{C.R.I.} = \frac{\text{DOLAR VALUE OF ALL COMPENSATION PAYMENTS OR RESERVES}}{\text{TOTAL MANHOURS WORKED}} \times 1,000$$

It was indicated earlier that the true meaning of ASA Frequency and Severity Rates is known mainly to safety people themselves, and that the upper echelons of management might be more amenable and appreciative of safety efforts if claim costs were more fully explained. The growing trend towards permanent partial disability awards for non-disabling injuries has watered down the significance of frequency data. Also, the exclusion of many hernia and disability back cases, because the ASA code relating to such cases disqualify them as work injury statistics, has tended to affect the significance of these rates for management.

SAFETY, COST AND PRODUCTION

We have established that a relationship does exist between safety, cost, and production, but there is no simple solution as to what can be done about it. These answers are extremely variable, and must be tailored to the individual needs of each problem. The answer to the following questions should help direct some thinking towards the solutions.

1. Is communication a major problem of safety, as well as production?
2. Is safety training a form of job instruction?
3. Is salesmanship an approach to cooperation?
4. Is hazard elimination a road to improved efficiency?
5. Is loss analysis the start for intelligent corrective control?
6. Do all the tools of safety aid in all phases of management operation?

If the answer to the foregoing questions is "Yes" then should we not ask ourselves, "Can we afford not to make safety a part and parcel of all our production planning operations?"

In summation, all members of the safety profession are well aware of the humanitarian aspects of their job, but they have a further responsibility. This is to recognize and use the language and statistics of top management in preparing and selling programs aimed at controlling economic loss.

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HOW MUCH

SAFETY FACTOR?

by ROBERT F. SCHOOF

When fatigue, impact loading and stress concentrations are fully considered, design factors of 5 or 6 may mean actual safety factors of 2 or even less

MANY SAFETY REQUIREMENTS have been established by governmental bodies, standards associations and industry groups to protect the public against injury and loss. In addition to complying with prescribed safety requirements, the designer must provide an acceptable product having a long service life. At the same time, the designer is called upon to make efficient use of materials. The choice of a proper safety factor is, therefore, a serious consideration for the engineer.

Although based in part on indeterminate factors, this choice can be guided by a number of general design approaches. The first of these approaches considers *equal stress design*, which requires that all parts are utilized at a consistent stress level and stress risers, such as sharp corners and abrupt steps in shafts, are eliminated.

A second general approach, *functional shape*, has been described as a "meditation" upon the shape that a structure would like to take. This design approach has been used to good advantage in such diverse fields as machine tools, bridge designs, modernistic building designs, and in streamlining practices. Although some of the end results may or may not possess esthetic value, these creations generally make efficient use of materials.

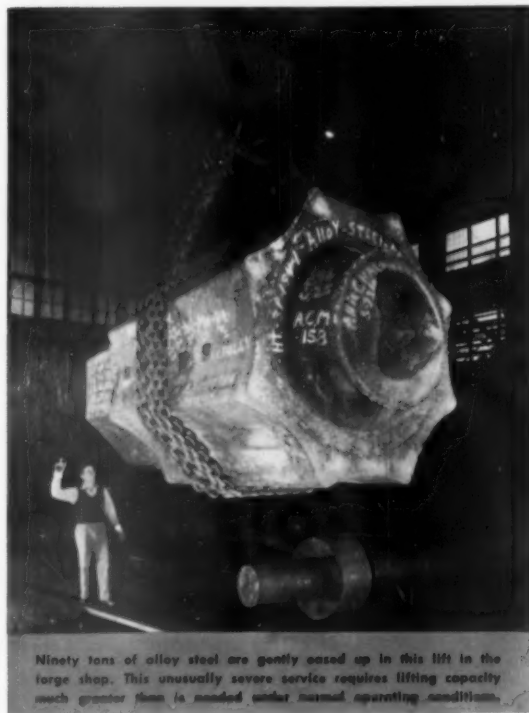
When the need is justified, an *individualized comprehensive stress study*, the third approach, is used. While usually costly, an intensive study of the design stresses and stress risers, possibly using strain gauges and photoelastic models, can determine with a good measure of precision the anticipated stress levels.



Robert F. Schoof, safety engineer for Allis-Chalmers Mfg. Co., holds BS and MS degrees in electrical engineering from the University of Wisconsin. A member of the Society since 1951, he is now secretary of the Milwaukee Chapter. Before joining Allis-Chalmers, he was a safety engineer with the American Insurance Groups. This is his first Journal article.

The designer will generally employ one or more of these approaches in his first analysis of a problem in building a device to perform a particular function. His design philosophy or perhaps the ultimate use or purpose of the device will govern his choice of safety factor. The safety factors required will generally be about equal for equal stress design and for functional shapes. In some cases, a smaller safety factor can be used if an individualized comprehensive stress study is made.

It is extremely important to determine at an early design stage the character of the stresses which could

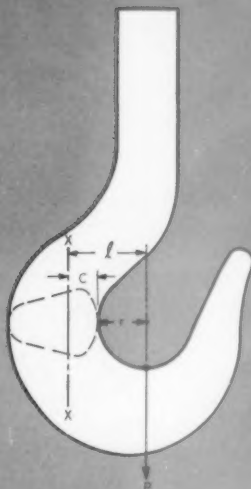


Ninety tons of alloy steel are gently eased up in this lift in the large shop. This unusually severe service requires lifting capacity much greater than is needed under normal operating conditions.



Six-step analysis of safety factors was utilized for the overhead lifting arrangement to remove cover and contactor assembly of the new all-immersed controller line. Factors considered are loss, load, stress analysis, fabrication, time and economy. (FIGURE 1)

Failure of hitching devices, which can result in personal injury and property damage, is prevented by a study of the safety factors involved. A minimum safety factor of 4-5, with all stress concentrations considered in the analysis, is specified on the ultimate strength of the material



$$S_T = \frac{P}{A} + K \frac{MC}{I}$$

S_T = max. tensile stress, psi.

P = rated capacity, lb.

A = area of critical section, sq. in.

K = curved beam stress correction factor

based on ratio $\frac{l}{C}$

M = bending moment, in.-lb.

C = distance from centroid to critical fiber, in.

I = moment of inertia of critical section about the centroidal axis XX , in.⁴

Min. Factor of Safety = 4.00 on the ultimate strength.

Min. Factor of Safety = 3.00 on the yield strength.



Laboratory tests and analysis of devices designed according to theoretical calculations often result in proving the design sound and, in some cases, can result in lowering the safety factor.

cause failure. Stresses which could render a material unserviceable before the end of the normal life are denoted as damaging stresses. These stresses may be at the yield point, thus causing deformation, or above the fatigue limit, subjecting the device to fatigue failure. Normal and cyclic stresses should be identified clearly. In some cases, because of complex shapes, these stresses may be difficult to determine. Even though test models may be built to resolve geometrical problems, there may be a lack of correlation between the test models or specimens and the finished product. This possible lack of correlation is particularly important when the fatigue limit is the criterion of design.

The fatigue limit applying to the material, obtained either from standards or found by a special test, is still not completely determinate because of variations arising from scale factors, heat-treating differences, and surface finish variations. The fatigue limit selected should therefore be the minimum of the possible values anticipated or suitable allowance should be made in the safety factor.

SIMPLE SIX-PART ANALYSIS

Only after the criterion of damaging stress has been established with reference to the application, and the performance capabilities of the chosen material determined, can safety factors be considered. The actual selection of a factor of safety based on a review of all the various areas of design and ultimate use can be simplified by a six-part analysis. These factors are loss, load, stress analysis, fabrication and assembly, time and economy.

In a normal application, each factor is equal to unity, and a standard factor of safety, based on either ultimate yield or fatigue strength, is used. Special applications could affect each factor within a range of 75 per cent to 200 per cent. Consideration of each factor in relation to the others leads to a decision on the overall factor. Direct multiplication of the six factors is not recommended, since it tends to give unrealistically high values. A high rating of loss factor may include a sufficient allowance for such factors as fabrication and assembly, and time.

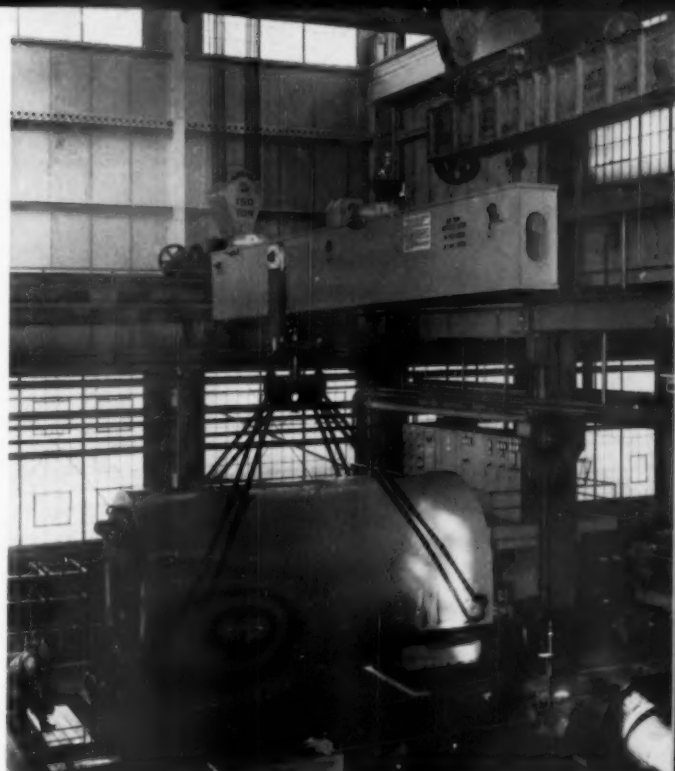
1. **Loss Factor** — what are the consequences of failure? Could failure cause loss of life, major property damage, interruption of production or service in a vital plant, or loss of user's good will?
2. **Load factor** — are the loads and therefore the anticipated stresses readily estimated with reasonable tolerance? Known impact or shock loadings which are calculable should be included in stress calculations. Suitable allowance in the safety factor should be made for complex impact

loadings where approximations or estimates of possible loads must be made.

Is there multiple unit operation where loss of function of one unit transfers additional loads to remaining units? In an emergency a unit may often be required to operate up to 150 percent of normal rating.

3. *Stress Analysis Factor* — is the stress analysis straightforward and simple or are there stresses involved which, inadequately covered by theory, require approximate methods of calculation? Do vibration and torsional resonance effects warrant investigations? Some spectacular bridge and tower failures have been traced to resonance or vibration effects resulting from wind loads.
4. *Fabrication and Assembly Factor* — Materials frequently change properties while being fabricated. Residual stresses can be produced from forming, bending, punching, hammering and other work. Heat-treating problems, such as inadequate annealing, or welding and plating processes, can produce difficulties. Assembly problems may arise when an unusually high degree of skill is required to obtain maximum performance. By establishing tolerances and inspection requirements, the designer can minimize the chance of error. However, when extensive fabrication or assembly operations on a device introduce changes of indefinite character, an increase over a normal safety factor is required.
5. *Time Factor* — Devices which at the time of construction may be more than suitable for the application may not be adequate in five or ten years. In addition to the effects of wear resulting in misalignment and other difficulties, there are the problems of corrosion, decay, metallurgical changes, brittleness, and creep. Loading changes may also affect some devices. These changes are particularly prevalent in material handling equipment and factory buildings where loadings are constantly increasing. In many cases the device of today may well be expected to do tomorrow's job at least for a time.
6. *Economy Factor* — Three basic considerations in economy are cost of materials, weight requirements and fabricating methods. Where materials are costly and production volume is high, overly generous safety factors are not sound and needed factors should be precisely determined. In aircraft construction, for instance, design for the lightest possible weight consistent with performance and safety requirements is the criterion and is basic for successful economic operation.

This six-step analysis of a specific application can give a definite basis for the selection of a safety factor. Where large production volumes are being contemplated, there is often a desire to reduce a factor of safety and thereby cut initial costs. Any reduction from established norms should be made only with a full understanding of all the factors involved. A major decrease in a previously accepted factor of



Large hydrogen-cooled generator is lifted onto railroad car for shipment. Calculated design stresses for both hook and beam include factors for various fillet radii, curved beams, and holes in plates. Stress levels thus permitted are below the fatigue limit under all except severe impact loads.

safety can rarely be made. However, decreases of 10 to 15 percent are often feasible and safe.

For common designs, experienced designers develop standard stress levels based on accepted safety factors. These factors may be established from a variety of sources.

A new line of oil-immersed controllers presented a problem in safety factors. One version of the device, a ground-supported model shown in *Figure 1*, required an overhead lifting arrangement to remove the cover and contractor assembly from the tank of oil for servicing and inspection. The arrangement consists of removable pipe supports, and I-beam and the actual lifting device. Applying the six selection factors showed that:

1. Loss factor is important because failure of the device could result in severe injury to personnel. An increase over the normal factors is required.
 $F_{Loss} = 1.25$
2. The load factor is a fixed factor, with the weights (allowing for friction) being definitely established. No impact loading.
 $F_{Load} = 1.0$
3. Stress analysis is straightforward for eccentric column loading, with no vibration or cyclic loading.
 $F_{Stress} = 1.0$
4. Fabrication and assembly factor is not a problem. The pipes and I-beam are standard struc-

tural shapes and no processing is involved other than cutting to length.

$$F_{Fab} = 0.90$$

5. Time factor is an important consideration because the device will be exposed to corrosive atmospheres and in service in excess of 10 years.

$$F_{Time} = 1.25$$

6. Economy factor is not affected because aluminum is required for portability of the unit and special efforts to further reduce the weight are not required.

$$F_{Econ} = 1.0$$

The overall factor should therefore be in the range of 1.40 times a normal factor of safety (1.4 X 5.0) or 7.0 on minimum ultimate of 15,000 psi.

The devices were therefore designed using allowable loading of 2150 psi in tension for the aluminum. Calculation using this design stress showed that the pipe supports should be 2 inches in diameter and the aluminum crossbeam a 4-inch I-beam. The lifting device utilized a 5/32-inch cable with a minimum ultimate load rating of 2800 lb. The load being lifted, allowing for possible friction, is under 400 lb. resulting in a minimum safety factor of 7 on the ultimate strength.

MINIMUM SAFETY FACTOR RANGE

Since failure of hitching devices can produce severe personal injury and major property damage, safety factors for this equipment are extremely important. A minimum safety factor range of 4-5 is specified on the ultimate strength. Calculated design stresses include stress concentration factors (K_1) for items such as various fillet radii, curved beams and holes in plates. The stress levels thus permitted are below the fatigue limit under all but severe impact loads.

An alloy steel bar, SAE 4340, used as part of a lift rig, is subject to fatigue failure because of its frequent loading. Since there is also moderate impact loading, a normal safety factor (for non-hitching equipment) could be 2.00 on the fatigue limit.

With reference to the six-factor analysis, the factors for this equipment are as follows:

$F_{Loss} = 1.25$	(Hitching equipment)
$F_{Load} = 1.25-1.50$	(Moderate impact loading)
$F_{Stress} = 1.00$	(Stress analysis straightforward. Fillet stress concentration factor of 1.5 included in stress calculations.)
$F_{Fab} = 1.25$	(Alloy steel, good quality welding and heat-treatment, rigid inspection)
$F_{Time} = 1.00$	(No moving parts, rating fixed)

$$F_{Econ} = 1.00 \quad (\text{Weight not critical, only one device being built})$$

The overall factor should therefore be approximately twice the normal factor of 2.00 or 4.00. This is based on true stress levels where stress concentration factors are included. Maximum design stresses would therefore be:

$$\frac{\text{Fatigue strength}}{4.00} = \frac{62,500}{4.00} = 15,625 \text{ psi}$$

$$\text{True safety factor} = \frac{\text{Damaging stress (i.e., fatigue limit)}}{\text{Maximum known working stress}}$$

$$= \frac{62,500}{15,625} \times (\text{impact allowance}) = \frac{62,500 (1.5)}{15,625} = 2.67$$

Use of a safety factor of 5 on the ultimate, without regard to impact and fatigue loadings and stress concentration factors, would result in a true safety factor of 1.26, derived as follows:

$$\frac{110,000}{5} = 22,000 \text{ psi nominal stress}$$

$$\begin{aligned} \text{True safety factor} &= \frac{\text{Damaging stress}}{\text{Maximum known working stress}} \\ &= \frac{\text{Fatigue limit}}{\text{Nominal stress (impact load) (stress concentration factors)}} \end{aligned}$$

$$\text{If } K_1 = 1.5$$

$$\text{True safety factor} = \frac{62,500}{22,000 (1.5) (1.5)} = 1.26$$

This value is hardly acceptable and emphasizes the need for a complete systematic analysis.

The selection of a safety factor is often governed by accepted standard design stresses or by municipal or state codes. However, many times, particularly on machine parts and devices, the selection of a safety factor is required in the early design stages. By reference and use of the six factors listed, this choice can be made using a comprehensive methodical analysis. True safety factors relating the damaging stress to the actual design stresses can be established, accurately representing the safety level intended by the designer.

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Abstracts

SAFETY AND RELATED FIELDS

All abstracts being published in the *Journal* are supplied by Engineering Index Inc., Engineering Societies Library, 29 W. 39th St., New York 18, N.Y. Because of space limitations, comparatively few of the abstracts from this service can be published in each *Journal* issue. However, subscriptions to the service are available from Engineering Index Inc., which will send, on request, a free 16 page catalog describing the service. For a nominal charge, Index subscribers may obtain copies of any of the articles which have been abstracted and, also, English translations of those published in foreign languages.

ACCIDENT PREVENTION

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ards given as well as set of rules for cutting steel wire; job requires skill and experience; proper safety equipment and instruction in safe procedure stressed.

New Approach to Safety During Turnarounds, W. A. Ramsay. *Oil and Gas Journal*, Vol. 57, No. 43 (October 19, 1959), p. 110-11. Special safety meeting and resultant safety survey sheet cut lost-time accidents at BP, Ltd's, Kwinana, Australia, refinery; safety record is comparable to that for onstream operation.

Prevention of Electric Shock Hazard as Basic Design Consideration, E. Schechter. *Electrical Manufacturing*, Vol. 65, No. 1 (January, 1960), p. 120-4. Design guide, based on analysis of existing literature, to optimum design procedures for prevention or minimizing of electric shock hazards; curves and nomographs; particular attention to hazard of large exposed non-current-carrying metal parts such as machine frames, also to hazard of exposed parts with sharp edges that tend to break skin.

Safety-Conscious Plant. *Plant Engineering*, Vol. 14, No. 1 (January, 1960), p. 132-3. Gibraltar Display Div. of Mead Containers, Inc. has cut accident rate 80% through simple and effective safety program, resulting in heightened plant morale, reduced operating costs, and increased efficiency and production; survey of every accident for past five years enabled analysis of causes, and methods of prevention of future accidents; methods of implementation of safety program described.

Sewage Works Safety, C. E. Keefer. *Water and Sewage Works*, Vol. 107, No. 1 (January, 1960), p. 27-30. Safety measures at Baltimore, Md., sewage works; automatic explosive gas detectors; protected access to facilities; safety of working on streets; statistics of accidents since 1940.

INDUSTRIAL HYGIENE

Abgasreinigung in der Lackdrahtfabrikation, E. C. Betz. *Draht*, Vol. 11, No. 5 (May, 1960), p. 250-2. Waste gas purification in lacquered wire manufacture; general discussion of origin and composition of noxious gases; reasons why dispersion or washing is unsatisfactory; description of different methods and apparatus for purification by oxidation (direct or catalytic combustion).

Ink Mist and How To Control It, V. N. Fedoroff. *Air Engineering*, Vol. 2, No. 2 (February, 1960), p. 21-3, 45. Operation of high speed printing presses creates ink mist problem that fouls presses, and causes toxic and explosive hazard in press rooms; methods of modern ventilation and filtration techniques which have solved problem for printing shops and newspaper press rooms are described.

NOISE CONTROL

Measurement and Abatement of Noise. *Heating and Ventilation Engineering*, Vol. 33, No. 393 (April, 1960), p. 445-52. Nature of noise is defined; scientific basis of its measurement; principles governing noise level reduction in heating and ventilation systems; it is found that high noise levels are injurious to health and even lower levels can affect efficiency of people exposed to them; best method of silencing is to prevent or reduce generation of noise at source.

Ventilation System Noise, H. C. Hardy. National Research Council—Building Research Institute—*Publ. No. 706*, 1959, p. 60-74. Philosophy of approach by which engineers and architects can solve problems of ventilation system noise and write realistic specifications; examples of bad planning; methods of computing sound power ratings and steps necessary in predicting noise performance; tables and graphs illustrate levels and methods.

NUCLEAR SAFETY

Aspects of Control of Radiation Exposure, D. J. Mathias, J. R. A. Lakey. *G.E.C. Atomic Energy Review*, Vol. 2, No. 3 (Spring, 1960), p. 172-6. Hazards of nuclear radiation must be evaluated and minimized during both construction and operation of nuclear power stations; comparatively simple modifications which have been made to standard x-ray machines to enable weld-radiography to be performed safely and conveniently on site are described; types of hazard apt to be encountered during operation of reactor station and general principles for dealing with them.

Safety Principles for Low Power Research Reactors, B. E. Eltham, E. P. Hicks. *Nuclear Engineering*, Vol. 5, No. 46 (March, 1960), p. 96-8. Current interest in low power pool and tank type reactors makes consideration of safety criteria regarding design and location important; restriction of excess reactivity of system, assurance of sufficient cooling in core to avoid fuel failure or meltdown, containment sufficient to control any incident, and instrumentation for control and safety circuits above minimum quality, are main aspects of safety criteria; some operational procedures described.

Training Plant Civil Defense Corps, A. W. Harrigan. *Safety Maintenance*, Vol. 119, No. 2 (February, 1960), p. 9-10. Western Electric's "Personnel Protection" program to train all employees in special action needed to minimize blast and radiation injuries; First Aid courses given, additional fire-fighting auxiliaries to supplement existing crews, training of rescue squads and radiological monitoring squads; alert system and shelter drills instituted; warden organization trained; manuals of training in personnel responsibilities.

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AMERICAN SOCIETY OF SAFETY ENGINEERS

Membership Information

THE American Society of Safety Engineers has established the following classifications of active membership.

ASSOCIATE MEMBER – To be eligible as Associate Member an applicant shall be at least twenty (20) years of age and

a. Shall have a degree in engineering from a college or university whose curriculum is accredited by the Engineers' Council for Professional Development or shall have legal registration as a professional engineer and, in addition, shall be engaged in safety engineering with at least one (1) year's experience, no time being credited to this one (1) year unless at least fifty (50) per cent of the time was devoted to safety engineering, or shall have supervision over the safety engineering function of his organization; or

b. Shall have a college degree other than that specified in "a" above and, in addition, shall be engaged in safety engineering with at least three (3) years' experience, no time being credited to this three (3) years unless at least fifty (50) per cent of the time each year was devoted to safety engineering; or

c. In lieu of a college degree, shall be engaged in safety engineering with at least five (5) years' experience, no time being credited to this five (5) years unless at least fifty (50) per cent of the time each year was devoted to safety engineering.

MEMBER – To be eligible as a Member an applicant shall be at least thirty (30) years of age, shall have the qualifications required for Associate Membership and also shall have (5) years' experience in addition to that required by and of a type defined in the subsection of the requirements for Associate Member which is applicable to him.

FELLOW – To be eligible as a Fellow, a Member shall be nominated upon the unsolicited recommendation of three (3) other Members, shall be at least forty (40) years of age, shall have been a Member for at least thirteen (13) years, and shall have been engaged in safety engineering for at least twenty (20) years, during at least five (5) years of which he shall have been in responsible charge of the safety engineering function of his organization. In addition, he shall have made an outstanding contribution to the safety engineering profession. Recommendations of candidates for the Fellow classification, along with substantiating data, shall be sent to the Secretary of the Society, who shall submit such recommendations and substantiating data to the Committee on Membership. The Committee on Membership shall report its findings to the Executive Committee for action. Fellows shall be elected by a majority vote of the Executive Committee.

AFFILIATE MEMBER – To be eligible as an Affiliate Member an applicant

a. Shall be at least twenty (20) years of age and shall be engaged in safety engineering with at least one (1) year's experience, no time being credited to this one (1) year unless at least fifty (50) per cent of the time was devoted to safety engineering; he may remain in this classification while qualifying for Associate Member or Member Classification; or

b. Not being engaged in safety engineering, shall be at least twenty-five (25) years of age and shall have pursuits, attainments in accident prevention, or practical experience, extending over a period of at least three (3) years, which shall qualify him to cooperate with members of the Society and to render service to the Society.

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General Electric Co. (3): Defense Electronics Div., Defense Systems Dept.; LMED-Armament & Control Section, Johnson City, N. Y.; Ordnance Dept., Pittsfield, Mass.

HAPO-CE&UO, Richland, Wash. Goodyear Atomic Corp., Portsmouth, Ohio.

Hughes Aircraft Co. (2): Hughes El Segundo; Tucson, Ariz.

Louisville and Nashville Railroad Co., Louisville Div., Louisville, Ky.

The Magnavox Co., Fort Wayne Area Plants, Fort Wayne, Ind.

North American Aviation, Inc., Autonetics, A Division of North American Aviation, Inc., Downey, Calif.

Northern Pacific Railway, St. Paul, Minn.

The Procter & Gamble Co. (2): General Office Bldg.; Ivorydale Tech. Center, Cincinnati, Ohio.

Reeves Brothers, Inc., Vulcan Plant, Buena Vista, Va.

Sandia Laboratory, Sandia Base, Albuquerque, N. M.

Shell Oil Co., Norge Refinery, Norco, La.

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Thiokol Chemical Corp., Reaction Motors Div., Denville, N.J.

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United States Rubber Co., Ball and Band Plant, Mishawaka, Ind.

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Western Electric Co., Inc. (3): North Carolina Works, Burlington, N. C. and Winston-Salem, N. C.; Hawthorne Works; Baltimore Works Mfg. Div.



Safety Officer Honored

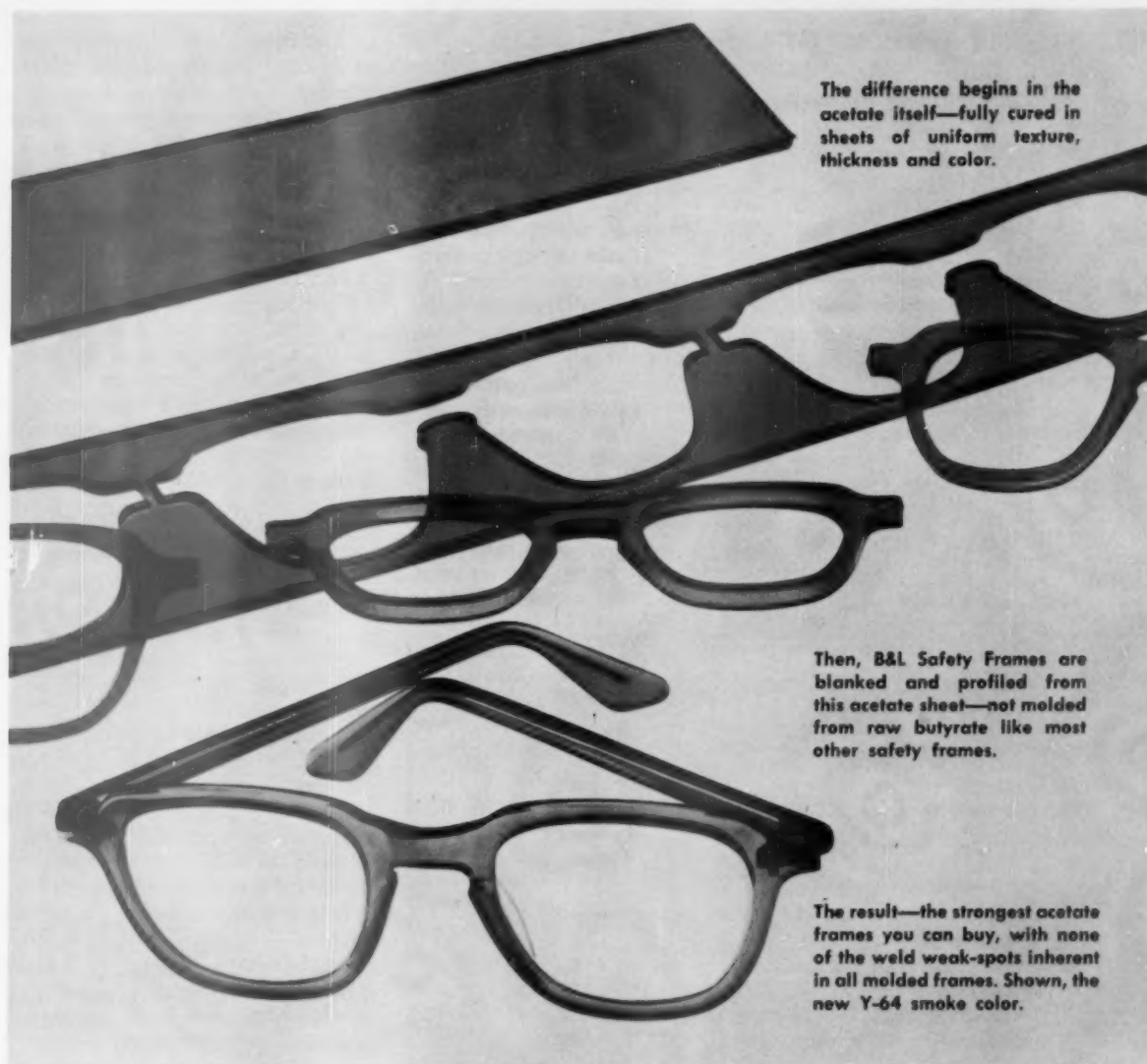
GEORGE R. WHITE (right), Atlanta, regional safety officer of the U.S. Post Office, was honored recently as Georgia's "Man of the year for 1960" in eye safety and employee visual well-being.

In presenting the award, Dr. John S. Thomas Jr., Georgia Optometric Association president, said that White had carried out a pilot eyesight conservation and safety program that has attracted attention throughout the nation. He spearheaded a public service project in which more than 3,000 employees of the regional and Atlanta Post Office were invited to participate in a visual screening program conducted with the cooperation of Roy McCleskey, of the Atlanta Post Office.

In 1952, White organized and headed the first Federal Safety Council in Tampa, Fla. He headed the Atlanta Council in 1957 and was elected chairman of the fourteen-state Southern Regional Federal Safety Council for 1959-60.

Coincidental with his being selected for the top safety award by the Georgia Optometric Association, Mr. White was presented a Post Office Department Superior Accomplishment Certificate and pin.

Details of eligibility requirements may be obtained by writing to Statistics Division, National Safety Council.



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Tensile strength at fracture B&L, 38% greater
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NBS Studies Transfer Of Liquefied Gases

Liquefied gases, such as hydrogen, oxygen, nitrogen, and helium, are widely used as refrigerants in basic research in chemistry, physics, and engineering. More recently these liquids have also come to play an essential part in the propellant systems of rockets and missiles.

Current interest in liquefied gases, both in private industry and throughout government, has led the National Bureau of Standards to take a second look at accepted methods for long-distance transportation of these fluids. Results of a recent theoretical study indicate that the pipeline method, now employed only in relatively short-distance transfers, can be extended to appreciable distances provided there

is an awareness of the performance limitations introduced by undesirable cool-down characteristics. The design of such a system, which in many cases could undoubtedly increase efficiency, safety, and economy, is relatively straightforward. The Bureau's study, conducted by R. B. Jacobs of the Cryogenic Engineering Laboratory, Boulder, Colo., provides the theory for designing long-distance pipeline systems for low-temperature operation, and also gives information required for numerical computation.*

*NBS Circular 596 (December 1, 1958). Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 30 cents.

Lousing Things Up

A MESS of free-thinking citizens are braking the "soaring sixties."

The guy with the stubs is Charley. He's a machinist who thinks using machine guards questions his skill.

Andy is the flat nosed one. He drives fast and thinks it's smart to ride the bumper of the car ahead.

The one-eyed joker is Herman. He's a chipper who thinks goggles are uncomfortable.

The skin-headed dame is Sally. She works on a machine and thinks hair nets aren't sexy.

Don't step on Horizontal Hampton there. He knows his capacity for booze but passes out before reaching it.

The gal in black alongside the ambulance is Mary. She didn't think she had time to put the medicine out of reach of the kids before going to play bridge.

The wheezy cuss is Egbert. He doesn't think it's necessary to read ventilation instructions on paint cans.

Old lard-bucket there is Willie. He doesn't believe in limiting calorie input to outgo.

The punchy guy is Arty. He thinks it's sissy stuff to wear a hard hat when his head is liable to get clobbered.

The brat starting the fire is Helen's . . . a mother who doesn't believe in repressing natural tendencies.

Pete is the squinty-eyed character. He's a welder who thinks an ultraviolet ray is a spring flower.

The comedian is Percy. He thinks folks should get their chuckles playing practical jokes.

The guy with the cast on his toe is Tom. He thinks safety shoes hurt his feet.

The black eye belongs to Jackson. He's a supervisor and forgets a guy who works for him has feelings, too.

The balloon-type arm is hanging on Fred. He thinks little germs can't hurt him by getting into small cuts.

Free thinkers don't always come up with the right answers.

ROBERT D. GIDEL

The Bureau's study aims to discover the equipment and techniques required for long-distance transfer of the liquids and whether these are available, and to determine what losses will occur during these long-distance transfers and whether they are tolerable.

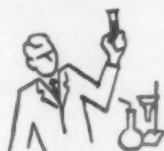
The primary component in the transfer's physical system is a length of insulated pipe—the transfer line. The state of the fluid is specified at both the inlet and outlet of this line. Either pumping systems or a process plant, such as a liquefier, can supply the energy required to force the fluid through the line. Pumping stations distributed along this transfer line may be more desirable than supplying all the necessary energy at the inlet. In this case, the system consists of a series of pipes with the fluid state specified at the inlet and outlet of each pipe. Since it is wasteful to carry unavailable energy (as sensible heat) through the system, intermediate stations along the line cool the liquid by one, or both, of two methods: refrigeration or flashing. If the liquid is flashed to atmospheric pressure, its vapor is discarded or piped back to a liquefier and the remaining liquid, which is at its normal boiling point, is pumped through the next section of pipe.

There are four ways in which losses occur: loss at the pump due to energy dissipation in the pump container and cooling prior to line entry; flashing loss caused by heat leak and energy introduced by the preceding pump; cool-down loss which occurs when the system is cooled from ambient to operating temperature; and trapped-liquid loss—from liquid that cannot be removed at the end of the transfer. The Bureau formulated relations from which each loss can be computed and expressed them in a form which facilitates computations.

In using the mathematical formulations to design a particular system, empirical information must also be employed correctly. Equations for heat leak and fluid drag have therefore been included.

The Bureau is now experimentally verifying its theoretical conclusions on long-distance transfer systems. In addition, the operating data on some large systems currently being built will be used.

OCCUPATIONAL HEALTH



By J. T. SIEDLECKI, Industrial Hygienist, NSC

Abstracts of current literature on occupational hygiene, medicine, and nursing

Study Animal Reactions to MEA

"The Effects of Continuous Exposure of Animals to Ethanolamine Vapor." By M. H. Weeks, M.S.; T. O. Downing, V.M.D.; N. P. Musselman, A.B.; T. R. Parson, B.S.; and W. A. Groff, A.B. *American Industrial Hygiene Association Journal*, Volume 21, No. 5, October 1960. Pp. 374-381.

TOXICITY of mono-ethanolamine (MEA) has been studied by exposing beagle hounds, guinea pigs, and rats to variable concentrations of air vapor mixture of this chemical.

Continuous exposure to 66 to 202 ppm. of mono-ethanolamine caused death and produced lung inflammation and liver and kidney damage in dogs, rats, and guinea pigs.

Even five ppm. produced minimum toxic effects. The atmospheric concentration of mono-ethanolamine to which man could be safely exposed would be below five ppm. Even at this concentration there may be narcotic effects.

Review Mercury Toxicity Data

"Mercury Toxicity From Industrial Exposure." By M. C. Battigelli, M.D., M.P.H. *Journal of Occupational Medicine*, Volume 2, No. 7, July 1960, Pp. 337-344. Vol. 2, No. 8, August 1960. Pp. 394-399.

THIS is a critical review of the literature describing mercury intoxication. The author lists 101 references giving emphasis to the publications of the past 20 years.

The author examines, summarizes and analyzes data provided by animal experiments and observation of human cases. He discusses industrial exposures, toxicology, metabolism, pathology, clinical aspects, prevention including environmental control and determination

of mercury and air in biological specimens.

Industrial exposures to mercury in the past 20 years have occurred in mining and refining of ore containing Cinnabar (HgS), in felt hat-manufacturing where mercuric nitrate was used as a carroting agent, in manufacturing of technical instruments, and in handling of elemental mercury manometric apparatus in the laboratory in manufacture of carbon brushes for electric equipment, in the manufacture of fluorescent lamps, in the assembling of neon signs, in the production and use of mercurial insecticides, and in the manufacture and use of mercury paints.

It appears that the rate of absorption of mercury influences not merely the over-all intensity and duration of the intoxication, but determines the degree to which specific organs may be involved. Solubility of the mercury compound plays an important role in absorption in the body.

For this reason the soluble mercury bichloride (HgCl_2) is considered so toxic. Individual susceptibility appears also to play an important role in mercury intoxication. Observation shows an individual variability of mercury urinary excretion in men exposed to similar air levels.

One investigator also points out that persons with clinical evidence of mercury intoxication excrete on the average less mercury than individuals apparently normal and exposed to similar air levels.

Mercury and its compounds have the capacity to inhibit enzymes, but it is not known which enzymes are involved.

Clinical manifestations of mercury intoxication are gingivitis,

tremor of the extremities, and emotional instability. Typical central nervous system changes are probably the greatest aid in early diagnosis of mercurialism.

There is no satisfactory treatment for chronic mercury intoxication. Environmental control in the prevention of mercury exposure is good ventilation, airtight distillation, equipment, and cleanliness of benches and floors. The author outlines methods for mercury determination in air and biological material.

Triethylborane Hazards Noted

"Study on the Toxicity of Triethylborane (TEB)." By W. E. Reinhart. *American Industrial Hygiene Association Journal*, Volume 21, No. 5, October 1960. Pp. 389-393.

TRIETHYLBORANE HAS been suggested for uses as a fuel additive for rocket missiles in the aircraft industries, and in non-military applications as a reducing agent, chemical intermediate, or polymerization catalyst.

Studies on animals indicate the inhalation of triethylborane paper in concentrations of 700 ppm. produces death in 50 per cent of rats exposed for four hours. Such concentration can be classified as being moderately toxic.

Toxicity signs noted in nearly all animals at the tested concentration were increased activity and excitement and pawing of the eyes and nose during exposure. At high concentrations some animals showed frothing of the mouth and/or nose, convulsions and death.

Triethylborane will ignite spontaneously in air and is a hazard from the fire standpoint. Since the

liquid has a vapor pressure of approximately 50 mm Hg at room temperature, the concentration of triethylborane surrounding the liquid would contain 65,000 ppm.

Vapors of this chemical will ignite at 1 mm Hg partial pressure (1300 ppm.). It is not correct to assume that, because triethylborane vapors ignite, there isn't any potential health hazard. Toxic concentrations can be easily achieved.

It has been recommended that the exposures to uncombusted triethylborane vapors should be kept at a minimum.

Fatal Gassing in Acetylene Plant

"Fatal Gassing in Acetylene Manufacturing Plant." By A. T. Jones. *Archives of Environmental Health*, Volume 1, No. 5, November 1960. Pp. 417-422.

THIS is a report on a fatal accident that occurred in an acetylene manufacturing plant. The operator was found lying across the top of an open calcium carbide generator feed hopper, with his head inside the filler hole.

Apparently he had placed his

head inside the hopper to determine the level of carbide in the generator. In so doing, he was exposed to an atmosphere deficient in oxygen and containing a high concentration, possibly up to 80 per cent, of acetylene.

As a temporary preventive action, it was recommended that compressed air line respirators be worn by operators when working around open hoppers. As a permanent preventive measure, it was recommended that glass ports in the hopper and good illumination be provided, so the operator can see the level of the carbide in the generator without exposing himself to hazard.

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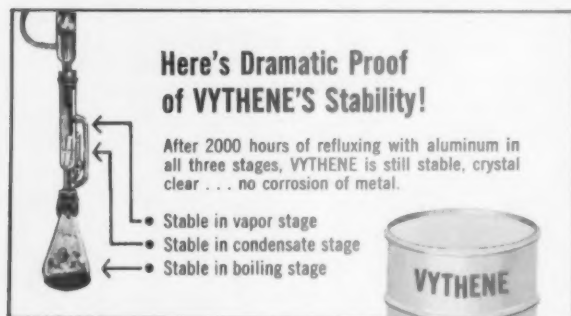
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Problem Areas in Pneumoconiosis

"Problem Areas in Pneumoconiosis." By N. Kleinfeld, M.D., and J. Messite, M.D. *Archives of Environmental Health*, Volume 1, No. 5, November 1960. Pp. 428-437.

IN THIS paper stress is laid on the importance of having sufficient information about the industrial environment, before a positive diagnosis of occupational and chest disease can be made.

Pulmonary disease may be occupational or non-occupational in origin. To establish a causal relationship, one must know the particle size of dust to which the worker is exposed, the physical characteristics of the dust and the details of the worker's job.

The authors cite case histories to illustrate the importance of these factors. They indicate it is important to know the epidemiology of the industrial dust disease, the similarity between occupational and non-occupational pulmonary diseases, and the incubation period of the occupational chest disease.

It is impossible to evaluate the case of pneumoconiosis solely by conventional methods of examination, i.e. clinical roentgenographic or pathological or the more refined methods of pulmonary function determination. The approaches discussed must be combined before any conclusions can be made.

The authors also discuss the medical and legal factors involved in problems of compensation relating to pneumoconiosis.

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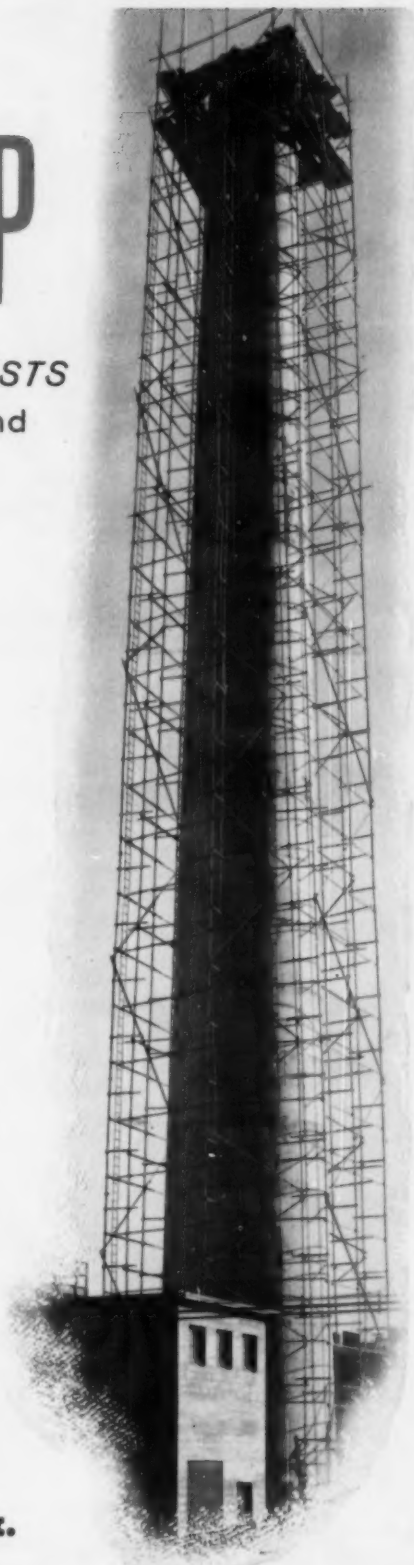
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Dear Boss

— From page 21

dust from the plant environment.

Mechanical injury can be damaging to an eye, in that you may find the employee has suffered a retina detachment, posterior hemorrhage or a displaced lens.

Vision tests were encouraged in industry by Stella Bruggen. She feels we can better utilize our people if we determine their capacity to see. These tests should not serve to eliminate employees but to point up to

them the need for additional medical eye care.

Mr. O'Neil hopes the time will come when we will spend more for prevention than on treatment of eye injuries. This would result from a well-functioning safety program. His thought is quite true, that a nurse knows how well the program is functioning by the number of injuries she cares for.

He showed us a safety film he has produced and directed. *It's Up To You* had a forceful industrial eye-safety message for all who saw it. It includes an eye-surgery se-

quence. This film was to receive an award from the Council during the Congress.

The second session offered a symposium: "Rehabilitation in Industry." The first speaker was L. C. Smith, director of industrial relations, Thilmany Pulp and Paper Co., Kaukauna, Wis. He also serves as president of the Fox Valley Sheltered Workshop in Appleton, Wis. His topic was "Employment and Rehabilitation of the Handicapped."

He suggests there are several things we can do with the handicapped:

1. Put them on relief.
2. Keep them in the home.
3. Put them in industry, where they have to compete with normal employees.
4. Employ them in a productive workshop, such as Fox Valley.

Fox Valley Sheltered Workshop was founded in 1957, because a number of workers formerly in industry were no longer able to remain there due to illness or injury.

Service clubs, industry, interested persons, doctors, nurses, lawyers and union representatives were determined to find a place for these people to work productively. From this group a board of directors was formed, representative of the community.

This board began to raise funds to immediately put these people to work and later to construct a building designed to the needs of the handicapped.

Construction tradesmen were very helpful in the planning and construction of the building. They came on Saturday to give time and effort for this great community cause.

While state and federal aid could have been used, the people of the area preferred it to be entirely a community project.

Funds were contributed and the building erected. It is now occupied by some 25 employees. It is self-supporting and stresses opportunity—not charity.

Industry in the area cooperates by sending in suitable work, mostly on a piecework basis. The greatest problem is finding work for the severely handicapped.

In their three years of operation,

METROX Portable Medical Oxygen

WHEN OXYGEN IS NEEDED... EVERY SECOND COUNTS

Portable medical oxygen is a fast-growing new concept in the field of oxygen therapy. Its life-sustaining application in heart attacks, shock, asphyxia, drowning... its vital breathing assist in respiratory illnesses, asthma, fainting—now demonstrates the importance of an immediately available supply of medical oxygen.

In the business office and at the plant... in the physician's office and in every police car... in the home and on the train... wherever people work... wherever they play... on whatever they travel... and wherever they live, **METROX** has earned a permanent position for whenever and wherever an emergency arises.

Exclusive Metrox Valve: Precision engineered **METROX** valve unit combines 72 separately designed parts into a single assembly and does away with old-fashioned multi-dial units. Tested in excess of 10,000 times. Its precise tolerances established to insure a dependable, constant flow of emergency oxygen at a regulated rate.



56 LITER UNIT



305 LITER UNIT

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CIRCLE 78 ON READER CARD



WIRE ROPE SLING *handles 30,000-lb lift with ease*

This 1-ft-thick granite slab, measuring 14 ft x 13 ft, and weighing about 30,000 lb, is typical of the heavy lifting jobs at Harris Granite Quarries, Salisbury, N. C. The wire rope sling supplying the muscle is a Bethlehem No. 167. It is a 6-part flat-body braided sling, with served loops.

Bethlehem slings are well made, with plenty of strength and flexibility, and good load-hugging characteristics. We make them in a range of styles and sizes to meet just about every lifting problem. If you would like full details, get in touch with the nearest Bethlehem sales office.



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... Versatility*

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Export Sales: Bethlehem Steel Export Corporation
*There's a distributor of Bethlehem Rope near you, supplied by
our nationwide network of wire rope mill depots.*

BETHLEHEM STEEL



they have had no disabling accidents and only three injuries requiring a doctor's services.

Dr. Fred S. Marshall, medical director at the Workshop, spoke on "Placement and Medical Management of the Handicapped." Various types of handicapped have been employed: amputees, cardiacs, those with back injuries, polio, speech impairment, and diabetics, mentally retarded and epileptics.

The type of work done at the workshop may be any of these: hand-folding, packing small articles, making of paper and plastic bags, hand work on gloves, taping boxes, office work, cutting and sewing together of slip covers for pillows or small cushions for chairs, and dipping articles in wax.

When they come to the workshop, the physical condition of each worker is reviewed by the medical director. Then they are placed in employment for which they are physically or mentally capable. Several of the Workshop's employees have been rehabilitated and returned to regular work in industry during the past three years.

The Workshop points up what can be done, when a community becomes concerned for people who might otherwise be leading useless lives. This community might not have become concerned except for an industrial nurse, Mrs. Hazel Leedke of Thilmany Pulp and Paper Company. Mrs. Leedke saw some of these people leave industry because they could no longer compete, and after serious thought she planted the seed for this project to grow into what it has become today.

The final session of the Occupational Health Nursing Section was co-sponsored with the National Safety Council, Industrial Medical Association, and American Society of Safety Engineers. The topic asked "Is There a Best Method of Applying Artificial Respiration?"

The American Red Cross through narration and demonstration gave us the "Evolution of Artificial Respiration" from ancient times through present methods.

Dr. Archer Gordon, director of heart and lung surgery research,

Childrens Hospital, Los Angeles, Calif., spoke, demonstrated and showed slides on "Principles, Practices in Teaching Mouth-to-Mouth and Manual Resuscitation."

Dr. Gordon feels that Sylvester's method of manual resuscitation is the best, because the person is in a supine position and the air passages are in the best possible position for the greatest intake of air.

The knowledge of mouth-to-mouth resuscitation is very important, because it can be started immediately, regardless of the position of the patient and needs no adjunctive device to be effective.

It has been determined that mouth-to-mouth resuscitation started three minutes after cessation of breathing will revive 75 per cent, 4 minutes—50 per cent, 5 minutes—25 per cent.

In a question-and-answer period after this session Dr. Gordon replied to these queries:

In drowning cases do you attempt to empty any water from the lungs?

In drowning, the person usually swallows the water, and it is in the stomach rather than the lungs. By

7 WAYS to Judge a Flammable Liquid Safety Can...



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Seams are lap-joined and electrically welded into durable "one-piece" container capable of standing up to rough service.



2. "SHOCK-RIM" BOTTOM

Can bottom is raised $\frac{3}{8}$ " up into can body to provide protective rim around base of can.



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Spout is "clinched" and soldered to top section of the can to withstand strain of repeated opening and closing.



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Convenient hand operation gives fast, positive control while pouring. Instantly shuts when pressure is released.



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Provide a durable double barrier. If inner wall is damaged, outer wall provides protection until unit is replaced.



5. LEAKPROOF SPOUT SEAL

Spring operated cap has ball and socket joint assembly to assure uniform, self-adjusting, liquid-tight seal of special leak-resistant gasket.



7. SHOCK GUARD CARRYING HANDLE

Handle design shields dispensing lever against accidental opening from shocks or bumps.



Protectoseal Safety Dispensing Cans incorporate these, and many more design and operating features to provide optimum safety and service. Because Protectoseal Safety Cans are built better to serve longer they are your best buy.

When you are considering the purchase or specification of Flammable Liquid Safety Cans, investigate the "hidden values" you get in Protectoseal Products. Compare them, point by point, with any other can and you will see why they are the quality standard of the industry.

Protectoseal Safety and Storage Cans are made in a wide range of sizes and types. They are stocked in strategically located Protectoseal Warehouses and Service Centers for quick delivery.



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A worker handling hazardous chemical fluids is properly dressed—with a Jackson Fiber Glass Safety Hat and F-1 Face Shield, with clear plastic visor.

Jackson Safety From Head To Chest

Head, Face, and Neck Protection in One Comfortable Quality Unit

Select the correct visor—clear plastic, green plastic, welding lens, or wire mesh. Choose a safety hat—of fiber glass, aluminum, or dielectric plastic. Order the F-1 face shield attachment to mount visor to hat. Give your people a quality safety unit fitted to them and their job.

The various visors snap on to the front of the F-1 face shield attachment, which in turn is firmly held to the hat with a simple elastic band. Visors raise and lower easily and there's plenty of breathing space between visor and face.

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For general impact and splash protection: Fire repellent plastic visor, 15 1/2" wide, 9" deep. Thicknesses: .020" in clear and three shades of green, .040" and .060" in clear only.

For scarfing and furnace work, heavy gas welding and cutting: Fire-repellent fiber visor with a 2" x 4 1/4" green shaded welding lens mounted in a plastic lens holder.

For foundry, furnace, and forging workers: A galvanized steel 24-mesh screen visor, 15 1/2" wide, 9" deep. Stops molten metal splashes and deflects heat. F-1 shields also mount to caps as shown.

For general impact and glare protection: Fire-repellent plastic, aluminum edged visor, 11 1/2" wide and 4", 6", or 8" deep. In four thicknesses. Three shades of green (.020" only) and clear.

THREE Different Hat Materials! FOUR Different Visors!

turning the patient on his side, with pressure on the stomach area, some of the consumed water may be emptied from the stomach.

If the patient has the teeth tightly clenched, how may an adjunctive device be inserted?

In this case, use mouth-to-nose resuscitation. Dr. Gordon also brought out at this time that mouth-to-nose resuscitation causes less air to go to the stomach, but you must allow a little more time for expira-

tion than with the mouth-to-mouth.

If cessation of breathing has been caused by gases, is there danger to the helper from the mouth-to-mouth method?

If the patient is away from the gases and the helper turns his head away during expiration, there is little danger.

The delightful portion of our meeting came when we gathered in

the Boulevard Room of the Conrad Hilton Hotel for a luncheon to honor past general chairmen.

The after-luncheon speaker was Russell Barta, director, Adult Education Centers, Chicago, who told us how we could bring leisure into our work and why we should put work into our leisure.

Leisure should not mean *time on our hands*. It should have purpose, discipline and control. He suggested adult education programs as a fine way to use our time away from work.

The arts—especially music and drama—can give us expression and help to develop moral greatness. Mr. Barta would like to see culture taken off the society page and integrated into the panorama of ordinary life.

At our work we should also have purpose, discipline and control. Work must have more meaning than the monetary value. It is a time to develop personality with each new experience, and add abundance and value to our living to sustain us in those later years when we can no longer work actively.

MRS. RUTH HAMMON
Plant Nurse #471



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Designed to eliminate waste, the Go-Jo Heavy Duty Dispenser delivers just the right amount of Go-Jo to get even the grimmest hands spotlessly clean. Go-Jo Creme Hand Cleaner is a concentrated formula containing GT-7 for dermatitis protection, plus soothing emollients to prevent chapping. When used in the Heavy Duty Dispenser, it provides four times as many clean-ups as "hand-scoop" methods.

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CIRCLE 29 ON READER CARD

New ASA Codes On Tramways, Mowers

Aerial passenger tramways and power lawn mowers are the subjects of two new American Standard Safety Codes.

Concern for the millions of American ski enthusiasts who use transportation facilities to climb mountain slopes stimulated creation of the code for Aerial Passenger Tramways, B77.1 — 1960.

A 1956 accident due to failure of the hauling wire rope of a chair lift caused the Eastern Ski Area Operators Association to consider establishment of the code. Co-sponsor is the American Society of Mechanical Engineers.

The Lawn Mower Institute, Inc., sponsored the ASA Safety Specifications for Power Lawn Mowers, B-71.1 — 1960.

Further information is available from the American Standards Association, Dept. PR195, 10 E. 40th St., New York 16.

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1960 Fire Deaths Total 11,350

U.S. fire deaths in 1960 reached an approximate total of 11,350, the National Fire Protection Association reports.

Another 70,000 persons were seriously injured by fire.

Destruction of property by fire totaled a record high of approximately \$1,541,000,000.

According to these preliminary estimates there were about 50 more

fire deaths in 1960 than in the previous year's total. Property losses are up sharply — more than \$100,000,000 — in comparison with the 1959 total.

Approximately half the fire deaths — more than 5600 — occurred in homes. About 30 per cent of the casualties were children. In at least 76 instances, families were virtually wiped out when four or more members were killed in a single dwelling fire.

The 1960 loss estimate for the first time passes \$1½ billion.

According to Z16

— From page 12

the secretary of the committee to send copies to the seven members of the group, for the Committee to review the case, write an opinion, and send it to the secretary, and for the secretary to summarize these opinions and send a reply to the safety man.

Many cases submitted to the committee are clear-cut, and decisions represent only routine applications of provisions of the Standard. Such cases could have been handled by the safety man with a savings in time and effort, and more prompt closing of the case.

The Standard has been written in a manner which, it is hoped, would permit the safety man to make his own decisions on cases, although complexity of injury circumstances did not permit the Standard to be a simple document.

Cases Ruled on by the Committee. To help the safety man make his own decisions on whether a disability should be included in his company's injury rates, descriptions are available of cases ruled on by the committee, including an index.

The index groups together similar cases and shows the committee's decision on each. At the present time, the index and descriptions cover the first 100 cases ruled on since the Standard has been revised, effective in 1955. Additional cases will be written up and included in the index at a later date.

Included in the first 400 cases are circumstances such as:

1. Plant employee hurt when sent to help fight a non-plant fire.
2. Employee injured on buffing machine while polishing his auto headlight.
3. Salesman tripped on sidewalk on way to dinner after day's work.
4. During coffee break, employee left premises and was hurt on broken sidewalk.

If a safety man has an injury which arose out of circumstances similar to those already ruled on, he need only refer to the index and case descriptions for a decision on reportability, thus saving himself time and accomplishing quick handling of the case. Copies of the first 400 decisions including the index are available from the American Standards Association.

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Any task with loads to lift, lower or pull is a job for Union Tuffy Slings and Hoist Lines. And because sling and hoist jobs vary all over the lot, Union Wire Rope engineers specialize in tailoring TUFFY products to

specific uses. You are invited to ask for this service—no extra charge.

4 New Union Slings

In addition to famed Tuffy Slings, Union Wire Rope offers in a full range of sizes:

1. Hand Braided six and eight part slings.
2. Uni-ply—a flexible multi-part rope laid sling with pressed-on metal ferrule.
3. Press-Grip wire rope sling with pressed-on metal ferrule.
4. Uni-Grip wire rope sling with return loop splice and pressed-on metal ferrule.

Union Wire Rope **Tuffy Tips** on safe use of Slings and Hoist Lines



How Much Lifting Should Be Done by Muscles?

The U. S. Dept. of labor recommends men should handle no more than 50 pounds; women no more than 25 pounds. This is for people of average size and weight, in normal physical condition. Mechanical hoisting equipment should be used for all loads not comfortably lifted by muscles.

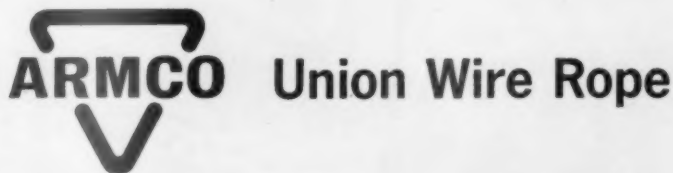
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Both free. Write for these 2 great Tuffy Service Manuals:

1. "Tuffy Tips" with more than a score of safety hints like the one shown here. Clever, helpful illustrations.
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WRITE Union Wire Rope, Armco Steel Corporation, 2224 Manchester Ave., Kansas City 26, Missouri



Coming Events

Feb. 3-4, Los Angeles.

Thirteenth Annual Industrial Engineering Institute, University of California, Los Angeles Campus (Schoenberg Hall). Dept. K, University of California Extension, Los Angeles 24.

Feb. 9-10, Los Angeles.

Eleventh Annual Governor's Industrial Safety Conference (Biltmore Hotel). Michael Flagg, coordinator, 455 Golden Gate Ave., San Francisco 2.

Feb. 9-11, College Park, Md.

Fifth Annual Industrial Fire Protection Short Course, Fire Service Extension Dept., University of Maryland, College Park. Robert C. Byrus, director, Fire Service Extension Dept., P.O. Box 85, College Park.

Feb. 20-23, East Lansing, Mich.

Tenth Annual Industrial Ven-

tilation Conference at Michigan State University. Prof. C. H. Pesterfield, chairman, Mechanical Engineering Dept., Michigan State University.

Mar. 1-2, Philadelphia.

Twenty-seventh Annual Regional Safety and Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, Safety Council, Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia 7.

Mar. 5-7, Atlanta, Ga.

Southern Safety Conference & Exposition (Atlanta Biltmore Hotel). W. L. Groth, executive director, PO Box 8927, Richmond 25, Va.

Mar. 14-15, Fort Wayne, Ind.

1961 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, manager, Fort Wayne Safety Council, Chamber of Commerce Building, Fort Wayne.

Mar. 14, 21, 28, Baltimore, Md.

Fifth Occupational Safety Seminar. Sponsored by the Baltimore Safety Council, Safety Engineering Club of Baltimore, and Department

of Labor and Industry, State of Maryland. Earl W. Smith, managing director, Baltimore Safety Council, 1511 Guilford Ave., Baltimore.

Mar. 28-30, Los Angeles.

Eighth Annual Western Safety Congress and Exhibits (Ambassador Hotel). Joseph M. Kaplan, manager, Greater Los Angeles Chapter - NSC, 3388 W. Eighth St., Los Angeles 5.

April 3-4, Boston.

Fortieth Annual Massachusetts Safety Conference and Exhibit (Hotel Statler Hilton). Sponsored by Massachusetts Safety Council, Safety Council of Western Massachusetts, and Worcester County Safety Council. Bert Harmon, manager, Massachusetts Safety Council, 54 Devonshire St., Boston 2.

April 11-12, Oakland, Calif.

Ninth Annual Northern California Safety Congress and Exhibits (Hotel Claremont). Sponsored by the Eastbay Chapter of the National Safety Council. Clinton W. Dreyer, managing director, 1322 Webster St., Oakland 12.



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What's the Wausau Story in 1961?

THE Wausau Story began when an era of experimenting ended.

That was in 1911, 50 years ago. The State of Wisconsin had just passed a Workmen's Compensation Law, first one in the country to be held constitutional. And on the same day that law became effective, the company that was to be known as Employers Mutuals of Wausau opened for business.

You see 1961 marks the 50th anniversary of Workmen's Compensation Insurance in America and also the 50th anniversary of its pioneer underwriter, Employers Mutuals of Wausau.



That's significant.

The Wausau men who banded together to form this mutual insurance company were lumbermen . . . and lumbering was a hazardous business. But their hands were tied if a workman was hurt on the job. The way the old Liability Laws were set up, to give money for a family to live on or to pay the doctor's bill could be construed that the employer was at fault for the injury. There was little choice but to wait for court action. That meant long delay because the courts were clogged. Gross extravagance too—in those days it cost about \$82 to get \$18 to the injured workman. This wasteful, round-about way of doing things went against the grain of men who respected



Our hometown depot is a familiar and friendly symbol for Employer Mutual offices all across the country. We write all forms of Fire, Group Health and Accident, and Casualty Insurance (including Automobile). We are one of the largest and most experienced in the field of *Workmen's Compensation*. Consult your telephone directory for the nearest Employers Mutuals representative or write us in Wausau, Wisconsin.

the dignity of work and had a neighborly concern for the welfare of their workers.

The Wisconsin Workmen's Compensation Law was a model for other states to follow. And the men who first banded together to make that law work gave us a heritage that will always be a part of Employers Mutuals of Wausau. That's why, in this anniversary year of 1961, we're doing more than lighting the candles on our birthday cake and enjoying our own party in a quiet way.



The Wausau Story today means more to more people. We are serving policyholders in almost every branch of business and industry, serving them with new science and skills that meet the requirements of a highly technical and rapidly advancing age. But the spirit behind our work remains the same. It's a spirit of fairness, dependability, efficiency . . . a spirit of friendly helpfulness and neighborly concern. That's the Wausau Way of Working.

And that's the Wausau Story in 1961.

Employers Mutuals of Wausau

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LIGHTWEIGHT SAFETY SHOES REDUCE FATIGUE TO CUT ACCIDENTS

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- SMART CASUAL LOOK
- STEEL SHANK SUPPORT

Even men who resist ordinary safety shoes go for the lightweight comfort and good looks of LITE KNIGHT Safety Shoes. They weigh a full pound less per pair—and this adds up to an amazing half-ton saved for every mile walked.

Gray, Loden Green or Houn' Dawg brushed pigskin uppers are tanned with Kemi Klad to keep their soft, casual look. The natural breathe-ability of pigskin means healthy ventilation. And thick, springy, oil-resistant neoprene soles cushion every step.



◀ Casual oxford or chukka styles in this exclusive Haus of Krause construction that permits the use of lightweight materials in LITE KNIGHT Safety Shoes while meeting all ASA requirements for toe protection.



Industrial jobbers interested in acquiring a franchise, write to Haus of Krause, Rockford, Mich.

CIRCLE 43 ON READER CARD

Wire

— From page 16

for highway routing and capacity should take into account how economic growth can be stimulated." It also urged federal appropriation to initiate projects for sealing abandoned coal mines.

Industrial Safety. The U.S. Department of Labor announced the injury rate for manufacturing in the third quarter of 1960 was 11.9 disabling injuries per million man-hours worked, a 7 per cent increase over the second quarter, but an 11 per cent decrease over 1959's third quarter.

The Department issued safety and health regulations for federal supply contracts under the Walsh-Healey Public Contracts Act, which requires that such contracts contain a stipulation barring use of premises, surroundings, or working conditions "unsanitary or hazardous to the health and safety of employees engaged in the performance of said contract."

These regulations replace standards last issued by the Department in 1956. The Secretary of Labor said facts declared in the regulations, regarding hazardous characteristics of many working conditions, "are soundly based in the experience of the Department and in the experience of outstanding public and private experts in their specialized divisions of the field of health and safety engineering."

However, he said these regulations extend into areas in which reasonable men may differ.

The regulations promulgate "a single standard of safety and health conditions," applicable in all states, for all work subject to the Walsh-Healey Act and are intended to "promote observance of the safety and health requirements by curtailing uncertainty on the part of those whose duty it is to comply."

The Department also hopes such regulations "will permit the administrative adjudication of many safety and health cases without the necessity of calling an expert witness to the place of hearing to testify to the hazardous nature of the working conditions denounced in the regulations."

Additional radiation standards applying the Federal Radiation

Council's recommendations are being drafted for inclusion in the regulations.

In their present form, these regulations cover buildings and appurtenances; stairways or steps; guarding of floor openings and holes and of open-sided floors, platforms and runways; railways and guards; elevators; illumination; ladders; aisles and passageways; material storage; outdoor storage; flammable liquids; paints and painting; fire prevention; pressure vessels; tools and equipment; ventilation and protection in welding and cutting; and electrical equipment.

Also included in the regulations are mechanical power transmission apparatus; guard standards for mechanical power transmission; machine guarding; woodworking machinery; housekeeping; toilet facilities and wash rooms; lunch rooms and food ventilating; drinking water; medical services; eye protection; environmental conditions; ventilation; noise; and personal protective equipment.

For bituminous coal and lignite mining, the regulations adopt by reference the Federal Mine Safety Code issued by the U.S. Bureau of Mines.

The Bureau issued proposed regulations to govern tests and certification of methane-monitoring systems to be incorporated in permissible equipment used in gassy mines and tunnels. The Bureau also has issued a progress report on research in using high-expansion foam to control underground mine fires.

The Interstate Commerce Commission issued its new rules governing monthly reports of railroad accidents under the new Accident Reports Act (See "Wire," October 1960). Reportable accidents are divided into three groups: train accidents, train-service accidents, and nontrain accidents.

Atomic energy activities involved many safety subjects. Rep. Chet Holifield, chairman of the Congressional Special Subcommittee on Radiation, decried the "hush-hush" attitude to atomic safety, and urged getting safety questions "out on the table and into candid public discussion."

He urged "it should be recognized more clearly that safety is an important part of research and de-

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CIRCLE 44 ON READER CARD

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CIRCLE 39 ON READER CARD

T-36

velopment" and warned the Atomic Energy Commission to be neutral and not be "an advocate for a particular interest in a safety contest."

The chairman of AEC's Aerospace Nuclear Safety Board said there were three considerations in connection with "the possible hazards to people from nuclear space power sources": potential contribution of radioactive materials (normal operations or accidents) to the atmosphere; local amounts of direct radiation or release of radioactivity from use of these devices; and areas of the world which might experience this localized radioactivity.

To avoid subjecting the American people to excessive radiation dosage from accidental release of fission products from systems operated in the U.S., three "basic safety objectives" have been developed for space nuclear power devices:

Under the most adverse conditions, they do not add materially to the general background atmospheric radioactivity; their use at a launch pad, operational base or test range must contain harmful radiation within the device or within the prescribed exclusion area; and on return to earth, the devices do not create a local hazard for people in the area.

The chairman of this board offered the view that "appraisal of the radiation risks that have been discussed reveals them to be no more than those risks encountered in the progressive development of steam and electric power, the airplane, the automobile, or the rocket." He saw the "ultimate role of nuclear energy in space" as "largely determined by its safety."

The AEC has been active in related fields. It issued proposed regulations formalizing procedures by which the public may participate in safety considerations of Commission-owned power reactors installed at non-AEC sites as part of conventional electric utility systems.

The AEC also amended its regulations to permit use of tritium on luminous clocks and watches, and said tritium is one of the radium substitutes "considered safer than radium."

The Federal Radiation Council invited comments on the problem of providing guides to be used in the control of human exposure from

environmental contamination.

The U.S. Public Health Service revealed "radioactive material in measurable quantities is a new and potentially very dangerous pollutant in our watercourses."

The first National Conference on Water Pollution was held through sponsorship of the U.S. Public Health Service. The surgeon general called the condition of the nation's rivers, lakes, and streams "a national disgrace."

Dr. C. D. Leake, former president of the American Association for the Advancement of Science, told the conference that dumping radioactive wastes into the ocean was "the most serious potential danger to our long-range health as far as water pollution is concerned." The AEC saw no potential hazard because of dumping low-level radioactive wastes into the ocean.


Traffic Safety. The President's Committee for Traffic Safety met with its advisory and technical groups and with state and municipal representatives to review and update its action program.

In a keynote speech, Dr. Waldo E. Stephens issued the challenge: "Could it be that one of our foremost tasks is to take inventory of our own concepts, ideas, and cliches, which have become a bit thumb-worn and outmoded?"

Other suggestions involved: improved staffing and administration of traffic courts; improved safety design of autos on a priority basis, with particular emphasis on defrosting and wiping equipment, braking systems, vehicle handling, standardized location of instruments and controls, restraining devices and better absorption of impact energy, evaluation of the safety aspects of automatic controls, and measures to forestall driver fatigue.

Additional recommendations urged planning of urban transportation facilities in coordination with safe traffic needs; stepped-up public information programs; initiative by civic and business leaders in establishment or strengthening of state and community citizen support groups; and increased emphasis by business and industry to off-the-job safety programs.

Rep. Kenneth Roberts announced plans for hearings in connection with new air pollution control legis-



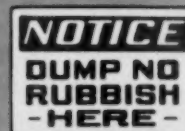
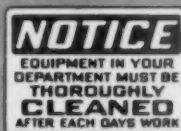
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CIRCLE 41 ON READER CARD

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lation. Among subjects to be included are motor vehicle and jet fumes. He commented that the auto industry is "feet-dragging" in making available as standard equipment "blowby" devices to eliminate auto crankcase fumes.

An advisory committee to the Public Health Service recommended tripling research to control air pollution, from \$11 to \$32 million annually by 1968. The committee recommended the federal government assume 40 per cent of this cost, industry 28 per cent, and state and local government 32 per cent.

Among other things, the committee's report, entitled "National Goals in Air Pollution Research," notes "air pollution . . . creates hazards for ground and air traffic."

The U.S. Bureau of Public Roads has given official concurrence to the newly approved national standards for traffic signs, signals and markings contained in the revised edition of the *Manual on Uniform Traffic Control Devices*.

Federal highway legislation provides that signs, signals, and markings on highways constructed by federal funds are subject to state approval, with federal concurrence designed to promote safe and efficient highway use. The Bureau announced its approvals will be only for devices conforming to the new manual.

The Department of Commerce announced a proposed rule change which would double permissible square footage of three classes of signs on the interstate and defense highways.

Commercial Transportation. Ernest G. Cox, chief of ICC's Section of Motor Carrier Safety, said investigation of truck accidents and a nationwide program of roadside spot checks confirm the need for better maintenance practices.

An appraisal of four years of such roadside inspections concluded "the total result . . . cannot be deemed a satisfactory condition."

Among major items noted were defects in braking systems, steering equipment, coupling devices, springs, tires, and electrical equipment. As a result, the ICC was testing "systematic maintenance procedures."

In a recent Motor Carrier Accident Investigation Report dealing

with defective brakes in violation of ICC's regulations, the Commission stressed the importance of a statutory requirement that private carriers identify themselves to the ICC, and stated it would recommend appropriate legislative action to Congress.

The report says "Education of private carriers through administrative and enforcement methods appears to be the most satisfactory means for improving the safety of such operations."

At present motor transportation of explosives and other dangerous articles is controlled by the Transportation of Explosives Act (See "Wire," October 1960) for common carriers by motor vehicle, and by the Interstate Commerce Act for contract and private motor carriers.

The ICC announced its intention to bring the contract and private motor carriers under the Transportation of Explosives Act, which provides heavier penalties for violations.

The Food and Drug Administration's investigation of illegal sales of amphetamine pills, popularly known as "bennies," to truck drivers has resulted in development of more than 55 court cases during 1960. Federal courts have imposed heavy penalties in some such cases.

Aviation Safety. The Federal Aviation Agency administrator accused private and commercial pilots and the airlines of obstructive pressure against all safety rules. He referred to pilot association resistance to rules keeping pilots in the cockpit, having inspectors aboard to check safety practices, and providing a 60-year age limit for air-carrier pilots.

The aviation industry and management, said the administrator, objected "because safety is expensive." He charged a "disturbing indifference" by some airlines and plane crews to safety measures.

FAA proposed a major revision of civil air regulations governing American flag carriers operating outside continental United States. Among significant changes are:

Application of same regulations to cargo-only planes as to passenger-carrying planes "for the protection of the public in the vicinity of airports and to insure the safety of the airplane and flight crew during en-



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CIRCLE 42 ON READER CARD

route flight over high terrain"; fire protection provisions on cargo-only planes; clearer specification of seat and safety belt requirements for occupants of air carrier airplanes, to require each person on board to occupy a seat or berth with a safety belt fastened during take-off and landing; a requirement for shoulder harnesses at pilot and flight engineer stations; and revised requirements for fuel supply.

Other proposed FAA regulations would require installation of flight

recorders on large aircraft certificated for operation above 25,000 ft. altitude and on large turbine-powered airplanes when operated for flight checks or training flights, ferry flights or airworthiness test flights. Other plans would require installation of cockpit voice recorders to preserve more detailed evidence on the cause of air crashes.

FAA's Bureau of Research and Development is developing systems and components for advanced air traffic control and navigation to pre-

vent mid-air collisions. Included is an airborne collision-prevention program.

Sen. Mike Monroney, Chairman of the Senate Air Safety Subcommittee, said the "surest way" to improve air safety is to have fewer planes in the flight pattern. This should be accomplished, he stressed, through building new airfields outside several larger cities.

Marine Safety. As a result of a major shipboard fire, the Navy ordered new ship-building safety precautions at its shipyards: adequate fire-alarm signals, and assured routes of escape; education of municipal fire departments in shipboard fire fighting; a ban on flammable liquids in containers on ships under construction; and a prohibition on temporary structures below decks for supervisory personnel.

The U.S. Coast Guard announced that between March 10 (when tabulation of statistics began under the new Federal Boating Act) and December 31, 1959, more than 2,000 pleasure boating accidents claimed 488 lives.

The Federal Trade Commission issued proposed trade practice rules for the pleasure boat industry and invited comments. These proposed rules include a requirement of disclosure of "material facts as to the safe maximum weight and engine capacity of such boats . . . For example, sellers of boats equipped with seats for x number of passengers, but which are not capable of carrying that number without subjecting passengers to hazards from overloading, shall disclose the safe maximum weight capacity of such boats, under normal use . . . Likewise, sellers of boats which cannot be used safely under normal conditions with an engine having in excess of x horsepower shall disclose such limitations."

The U.S. Army Corps of Engineers has embarked on a long-range program to minimize damage done on inland waterways to small pleasure craft by waves created by passing commercial craft, without impeding commercial shipping through speed controls on vessels passing pleasure-craft anchorages.

Consideration is being given to sturdier terminals for pleasure boats, their safer location, and an appropriate educational program.

CIRCLE 36 ON READER CARD



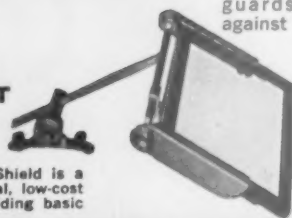
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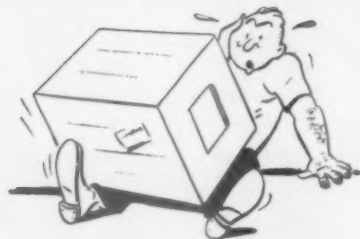
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CIRCLE 37 ON READER CARD

Calendar Contest For November



Man of muscle and hustle — that's Lee.
"Stand back — Let me do it," said he.
So he tried it — and wow!
Just look at him now

Winner of the \$100 first prize in the National Safety Council's November Safety Limerick contest was John D. Larimer, Armour and Company, Pittsburgh, Pa. He completed the limerick with this final line:

"No judgement for budge-ment had he!"

The monthly contest appears on the back pages of the Council's calendar. Theme for the November contest was "Big Backache."

Second prize of \$50 went to Charles Rawnsley, Atlantic and Pacific Tea Co., Boston, Mass. His entry was:

"'Help Insurance' is best policy!"

Mrs. Tom Clarke (individual member), Memphis, Tenn., won the third prize of \$25 for this suggestion:

"'Overbearing' was right word for Lee."

The 30 winners of \$5 prizes are:
Tom Berkey, General Electric Co., Portland, Ore.

Mrs. R. K. Petersen (individual member), Fresno, Calif.

Miss Doris S. Lewis (individual member), Fort Myers Beach, Fla.

Mrs. J. W. Morton Jr. (individual member), Knoxville, Tenn.

Mrs. H. Shepherd (individual member), West Allis, Wis.

Mrs. Mildred C. Simmons, Syracuse Public Schools, Syracuse, N.Y.

Mrs. J. J. Lambert, Yellow Cab Co., Los Angeles, Calif.

F. E. Wilson, Fidelity Machine Co., Philadelphia, Pa.

Mrs. Carl Duncan (individual member), Greenfield, Okla.

Mrs. Paul W. Ownby (individual member), Salt Lake City, Utah.

Mrs. Alberta Schumacher, Inland Div. of General Motors, Dayton, Ohio.

Miss Joan Halle Riley (individual member), Banning, Calif.

Robert E. Davis, U.S. Steel Corp., Hobart, Ind.

Mrs. Dave Wangsgaard (individual member), Ogden, Utah.

Miss Marie McKasty (individual member), Yaphank, N.Y.

Mrs. Frank Angona, Mobile Oil Co., Dallas, Tex.

Mrs. Jessie Belitsky, Goodyear Aircraft Corp., Akron, Ohio.

Mrs. Marge Blalock (individual member), Abbeville, Ala.

Mrs. Albert Rehder (individual member), Hawarden, Iowa.

Mrs. Ned Fish, University of Missouri, Columbia, Mo.

Mrs. Joseph H. Lacey (individual member), West Chester, Pa.

Mrs. Betty Ensle, Missouri Pacific Railroad, Osawatimie, Kan.

Mrs. Wilma V. Stegmuller, California

and Hawaiian Sugar Refining Corp., Ltd., Aiea, Oahu, Hawaii.

Arthur L. Handley (individual member), Atlanta, Ga.

E. M. Bostic, Mason Dixon Lines, Kingsport, Tenn.

Max Levin, U.S. Post Office, Milwaukee, Wis.

Mrs. Olga Jason (individual member), New Bedford, Mass.

Mrs. Earle Boyle, Buckeye Steel Castings Co., Columbus, Ohio.

Buell R. Snyder, Shepherd Correspondence School, Philadelphia, Pa.

T. V. Smith, McDougal Livestock Co., Collinsville, Calif.

CIRCLE 34 ON READER CARD



TOE GUARD ➤

fills a demand for toe protection in occupations where hazards injurious to toes exist. They fit any shoe, afford maximum toe protection, and like the foot guards do not encase the toe to the discomfort of the worker. (Style #700 illustrated.)

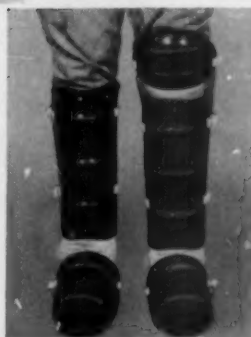


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These guards provide protection for the instep, shin and knee. Light weight, absolute freedom of leg motion, comfort and utmost protection are provided by the leg-contour shaped "Sankey" fibre guards. Guards are used when handling pulpwood, clearing brush, cutting cane, and numerous factory operations. (Right-style #320) (For right-style #330)

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225 SIXTH ST. — NSC ELLWOOD CITY, PA.



FOOT-TOE-LEG Protection by "Sankey"

(left) Improved FOOT GUARD
(Style #200 illustrated)

FOOT GUARDS consist essentially of a metal shield to be worn over the shoe whenever the foot is in danger of being either crushed or cut. The metal shield is designed to furnish a maximum amount

of protection to the entire foot—not merely to the toes alone, but also to the instep—against hazards from falling, rolling or flying objects, or from accidental tool blows.

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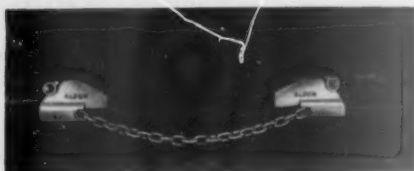
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CHOCKS!

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ALDON Double-Chain Type has two chocks connected with strong chain welded to each block, thus preventing travel in either direction. Handles provided. Weight only 10 lbs. Safe, sure and dependable. Finished in maintenance of way yellow. Hardened Tool Steel Spurs for positive gripping of rail.



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- No holes to drill.
- No rail joint interference.
- No special tools needed.

ALDON Car Stops are portable, and are easily-quickly attached to or removed from rail with only a wrench. Used in pairs, they provide maximum safe, dependable and sturdy service. Adjustable to all rails with maximum leverage clamps. Weight 150 lbs. per set.



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CIRCLE 45 ON READER CARD

PERSONALS

News of people in safety
and related activities



Russell D. Eberly

RUSSELL D. EBERLY has been promoted to manager of safety in the Central Employee Relations Department of American Oil Company, effective January 1, 1961, after reorganization of American Oil and Standard Oil Company (Ind.).

With the company for 37 years, Eberly has been assistant manager of safety in the Chicago general office. He succeeds the late William O. Wilson.

Mr. Eberly joined the Whiting, Ind., refinery in 1923 and became assistant safety director in 1930. He was appointed supervisor of safety and head of the safety department at Whiting in 1934 and then transferred to the Chicago general office as assistant manager of safety in 1946.

DR. LUDWIG G. LEDERER has been named medical director of American Airlines.

Since 1942 Dr. Lederer had been medical director of Capital Airlines in Washington, D. C. He maintained private practice at Washington National Airport and served concurrently as medical consultant to the Herndon Clinic for medical activity at Dulles International Airport.

National Safety News, February, 1961

H₂S Kills Safety Man, Plant Worker

Failure of a 2-in. diameter pipe nipple below a 5,000-gal. sodium sulfide outdoor storage tank at Hooker Chemical Corporation's Niagara Falls, N.Y., plant resulted in the death of two men and hospitalization of others recently.

The men inhaled concentrated hydrogen sulfide gas, formed by reaction of the sodium sulfide liquid pouring onto the ground, contacting acid and generating the gas.

The two dead were PATRICK J. CARMODY, supervisor of health and safety at the plant and a member of NSC's Chemical Section, and RAY F. SHIVELY, a chemical reactor operator who had been working in an adjacent building. The colorless gas enveloped an area estimated at 200-yards diameter.

Officials said some of the tank's contents had been transferred to a process making an automotive gear oil additive. The line was being emptied to prevent freezing as a normal cold-weather precaution, when the nipple between the bottom of the tank and a valve broke, leaving no way to shut off the tank. The entire contents poured onto the ground below. To neutralize the reaction and prevent further gas formation, large quantities of an alkali were added to the spilled chemical. No fire or explosion occurred. Operation of the process resumed in the afternoon.



Patrick J. Carmody

National Safety News, February, 1961

HIS FAULT? YOUR FAULT?

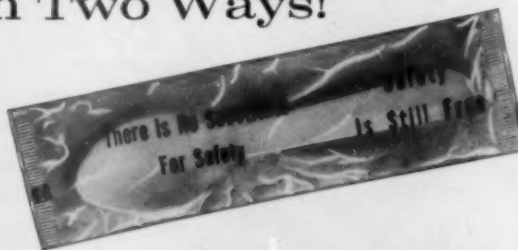


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tread with
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STAIR TREADS

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Use Safety GRIP-STRUT stair treads throughout your plant, on your manufactured products for greater anti-skid protection. All one piece of material with open area in excess of 55% total area, easy to flush clean, greater strength with less weight, in steel or aluminum.

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CIRCLE 49 ON READER CARD

Safety Library

— From page 50

Material Handling

"Handling Goods; Part 1: Moving Heavy Weights by Means of Rollers." Henry A. Hepburn. *The British Journal of Industrial Safety*, Autumn 1960, Vol. 5, No. 53, pp. 50-55.

"Plan Now to Winterize Your Materials-Handling Equipment." *Pit and Quarry*, December 1960, pp. 108-109, 112.

Petroleum

"Old Pipe Corrosion Safeguard Is Revived." *Petroleum Week*, October 28, 1960, p. 46.

"Repair-Time on Pipeline Cut From Days to Hours." *Petroleum Week*, October 21, 1960, pp. 86-87.

"Safety Rules Set for LPG Samples." *Petroleum Week*, December 2, 1960, p. 52.

"Using Little Explosions to Tame Big Explosions." *Petroleum Week*, October 21, 1960, p. 73.

Programs

"How to Use Mistakes." S. G. Williams. *Textile World*, December 1960, pp. 123-124.

"Our Best Safety Efforts Are Demanded." *The Paper Industry*, November 1960, pp. 581-582.

"They Put Christmas Into Their Workaday World." *Journal of American Insurance*, December 1960, pp. 26-29.

"Three Ingredients for Safety." *Pulp and Paper*, December 1960, pp. 97-99.

Resuscitation

"Closed Cardiac Resuscitation — Another Emergency Method of Resuscitation." Martin C. McMahon. *Firemen*, October 1960, pp. 8-9.

Roofs

"Fire-Safe and Windproof Metal-Deck Roofs." *Plant Maintenance & Engineering*, December 1960, pp. 37-39.

Safety Equipment

"Contract Allowances for Safety Equipment and Work Clothing." 1959. *Monthly Labor Review*, November 1960, pp. 1189-1192.

"An Emergency Shower for Persons Working With Corrosive Liquids." *The British Journal of Industrial Safety*, Autumn 1960, Vol. 5, No. 53, pp. 46-47.

"What You Should Know About Respirators. Part V." H. H. Fawcett. *Air Engineering*, September 1960, pp. 45-47.

Saws

"Transparent Guard Increases Saw Safety." *Plant Maintenance & Engineering*, December 1960, p. 36.

Spray Painting

"Spray Painting Without Com-

pressed Air." Christian F. Berghout. *Archives of Environmental Health*, p. 78/534-83/539.

Storage

"Safe Storage in Industry." V. A. Broadhurst. *The British Journal of Industrial Safety*, Autumn 1960, Vol. 5, No. 53, pp. 56-60.

Uranium

"The Industrial Hygiene of Uranium Refining." Emil Christofano and William B. Harris. *Archives of Environmental Health*, November 1960, pp. 74/438-96/460.

Watchmen

"Watchman and Alarm Service." *The Sentinel*, Dec. 1960, pp. 4-5.

ADDRESSES OF MAGAZINES

Readers are asked to send their requests for copies of magazine articles to the publishers. The NSC Library is unable to fill such orders.

Air Engineering, 450 W. Fort St., Detroit 26.

Archives of Environmental Health, 535 N. Dearborn St., Chicago 10.

Best's Fire and Casualty News, 75 Fulton St., New York 38.

British Journal of Industrial Medicine, Tavistock Square W.C.1, London, England.

The British Journal of Industrial Safety, 52 Grosvenor Gardens, London S.W.1, England.

Business/Commercial Aviation, 205 E. 42nd St., New York 17.

Electric Light and Power, 6 N. Michigan Ave., Chicago 2.

Fire Engineering, 305 E. 45th St., New York 17.

Industrial and Engineering Chemistry, 1155 Sixteenth St., N.W., Washington 6, D.C.

Industrial Hygiene Journal, 1014 Broadway, Cincinnati 2, Ohio.

Industrial Medicine and Surgery, P.O. Box 44-306, Miami 44, Fla.

The Inland and American Printer Lithographer, 79 W. Monroe St., Chicago.

Journal of American Insurance, 20 N. Wacker Dr., Chicago 6.

Journal of Occupational Medicine, 28 E. Jackson Blvd, Chicago 4.

Journal of the American Medical Assn., 535 N. Dearborn St., Chicago 10.

Monthly Labor Review, U.S. Department of Labor, Washington 25, D.C.

The Paper Industry, 431 S. Dearborn St., Chicago 5.

Petroleum Week, 330 W. 42nd St., New York 36.

Pit and Quarry, 431 S. Dearborn St., Chicago 5.

Plant Maintenance & Engineering, St. Joseph, Mich.

Pulp and Paper, 1791 W. Howard St., Chicago.

Quarterly, National Fire Protection Assn., 60 Batterymarch St., Boston 10.

Sentinel, 85 Woodland St., Hartford 2, Conn.

Textile World, 330 W. 42nd St., New York 36.

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Rodger Coyne, chairman of the awards committee of the NSC Labor Conference, holds the plaque symbolizing the Harry Read Memorial Award of Honor, to be awarded for the first time in 1961. Coyne is director of occupational health and safety for the International Union of Electrical, Radio and Machine Workers, AFL-CIO.

Council Awards to Labor

Award recognition of organized labor's participation in occupational and off-the-job safety will be made for the first time by the National Safety Council at the 1961 National Safety Congress.

Honoring the memory of the late assistant to the AFL-CIO secretary-treasurer, and the first NSC Vice President for Labor, will be the Harry Read Memorial Awards. Given in three degrees (honor, merit and commendation), they will be based on the scope of union safety and health programs and co-operation with other organizations.

Individual members of labor organizations are eligible for a citation for distinguished, outstanding, or meritorious service to safety. Sponsored by the NSC Labor Conference, the awards will be for outstanding safety efforts.

Applications for the 1961 awards, due before July 1, are available from the Labor Department, NSC, as is a brochure giving complete information.

Awarded to individuals who are members of labor organizations will be this citation for noteworthy service to safety, also sponsored by the NSC Labor Conference.



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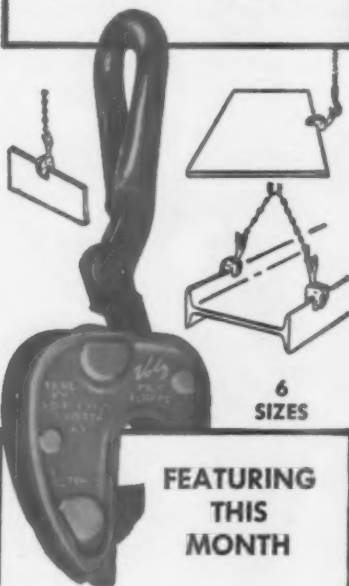
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Motivation

— From page 30

comparisons with respect to drives, motives, and motivation, let's list the basic drives and several motives.

All of us are familiar with the natural, instinctive drives (here placed in order of dominance): thirst, hunger, sex, exploratory, and a recent addition — mastery.

Mastery probably lies between drives and motives, but many recent research developments place it nearer to tissue-need drives. This is a natural deduction, because there is new evidence that our motives have their roots in natural drives.

Important to remember is that drives have an order of precedence; the strongest one gets attention before the others.

With motives, it's a different story. Motives, being emotional, do not have a fixed order of dominance but can vary in strength depending on the appeal to the emotions.

Many motives can compete for our attention at the same time. The one that appears to offer the most reduction of anxiety, fear, and tension usually wins over the others.

A motive must withstand repeated competition with other motives, repeated diversions and assaults. Drives with tissue-need origins and order of precedence do not have to face such competition. When thirst and/or hunger are extreme, they usually override all else.

But once thirst and hunger are allayed, motives can be revived and with proper incentives resume their striving for the goal.

A particular motive can have several fates. It can:

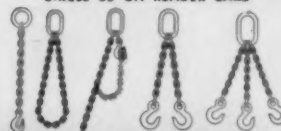
1. Be successful in the competition with other motives.
2. Be only partially successful.
3. Be replaced with another; i.e., give way to a substitute.
4. Be completely blocked or inhibited.

Obviously, motives must be strong, rugged fellows. In this struggle, survival is by the fittest.

From experience we know safety has strong competition. It behooves us to know the facts and be able to use them effectively.

A list of various motives implied might include: social approval, con-

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Probably you are wondering why I haven't included such familiar terms as praise, reproof, and rewards. That's just my point. Before we can arrive at the secret of motivation, we must be sure of what we mean by drives, motives, and incentives; there is a great deal of confusion as to what each is and what its functions are. Too often incentives and motives are used interchangeably. This is wrong. It leads to poor, conflicting, confused efforts to motivate.

The underlying truth is: Drives and motives are the same for everyone. They are broad concepts. Incentives vary with the individual, for they are the intermediate

achievements which impel the person to achieve the goal.

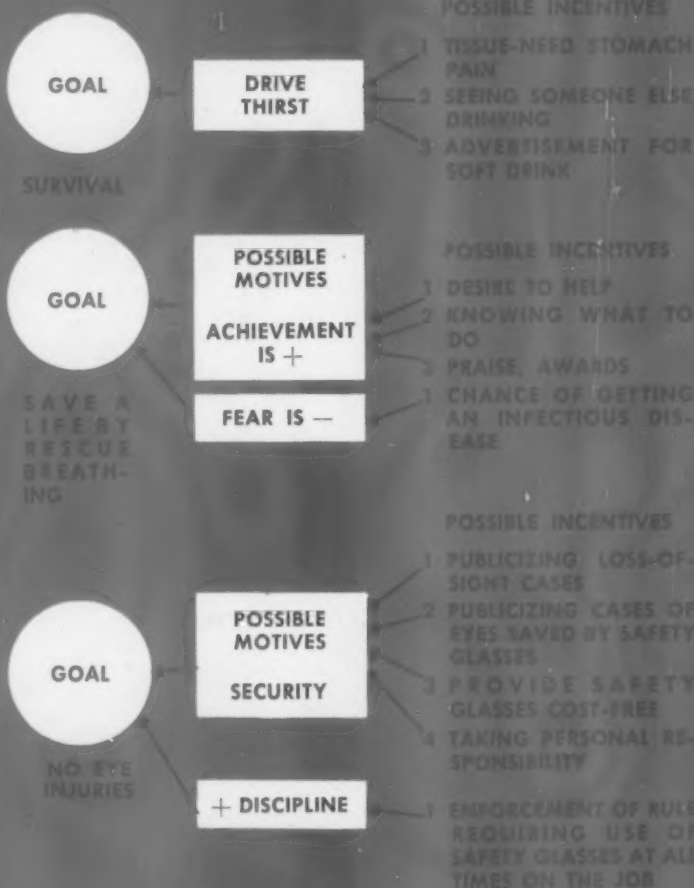
Remember the definition of motivation: Motivation is the supplying of incentives which impel an individual to achieve a pre-selected goal. And an incentive is anything which an individual feels will satisfy a drive or motive.

Such things as praise, reproof, rewards, rivalry, and participation are incentives, and it's the incentives we must supply, not the motives. Motives are universal, human conditions—the same for everyone, just as drives are.

Here's the important, vital concept that distinguishes drives and motives from incentives: Drives and motives are conditions. A condition is something that necessarily precedes and sets up the climate for

—To page 125

GOALS, DRIVES, MOTIVES, AND INCENTIVES

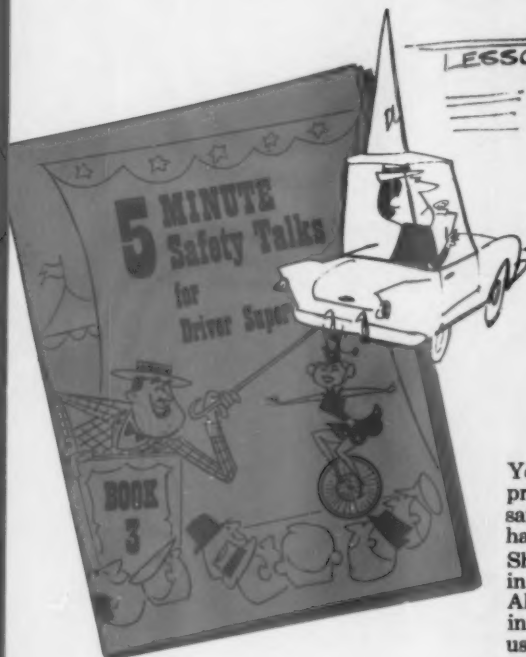


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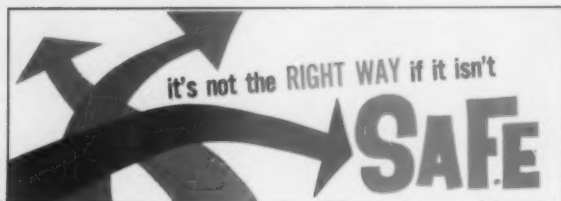
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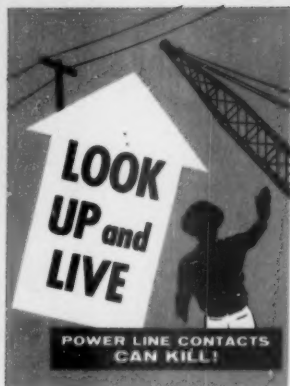
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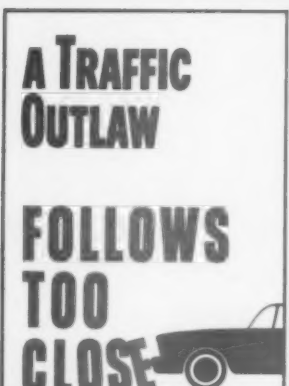
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Motivation

— From page 118

an action and its result, but which does not of itself produce the result.

It is incentives which produce achievement of the goal, if and when drives and/or motives provide the necessary conditions under which incentives can function effectively.

Before we list key facts about drives, motives, and incentives, there is one more pivotal concept. (See diagram page 29.)

I call it "pivotal," because it is the point of departure which determines whether we are going to motivate in the true sense we described earlier or pervert and divert through control, brain washing, and propaganda.

In the pivotal concept there are two kinds of motives: positive and negative motives. In the partial list of motives listed, positive motives have been mentioned. Too often, discussions deal exclusively with positive motives alone, because it is thought only things which give pleasure reduce tension. This gives a distorted, one-sided picture.

There are four motives which can be positive or negative. These four motives—discipline, punishment, tension, and attitude—are what psychologists call ambivalent. They combine two possible impulses as opposite in nature as love and hate. (See diagram page 28.)

Consider discipline. It's important from an on-the-job captive-group standpoint. Understanding discipline in the interests of the persons being motivated is positive, while discipline solely in the interest of the motivator is negative. The same is true of punishment. When both are negative, they have a close kinship with fear and anxiety, two negative motives which can disable our perceptions and in their extremes cause panic.

When they are positive, they are among our strongest motives. It is unfortunate that these two motives are so often viewed only from their negative standpoint. The same is true of tension. People see attitude a little differently. Most folks agree it can be good or bad. It's farther out from the pivotal point.

An ambivalent motive has an unconscious, added impact on an individual, and when he senses the in-

tent behind it, its effect is intensified and amplified. This is true even when the person is complaining about it.

Why? Because ambivalent motives are those associated with and ascribed to authority figures. When we have confidence in and respect for the authority figure, we get a relief from tension by his assumption of responsibility.

Emotional content, impact, and positive or negative nature of powerful ambivalent motives are dependent on the use made of them by the motivating authority figure.

Solely positive motives are obviously effective motivators, and solely negative ones are often barriers to goal seeking and attainment. Yet, negative motives, fear, and anxiety can be strong motivators. One example is their use in the collection of debts by collection agencies.

Dr. E. H. Barnes, psychologist for the National Accounts System says: "The basic approach in the collection of debts is creation of fear and anxiety in the debtor, which he can only dispel by paying the debt. You can't get away from the use of fear and anxiety as motives, and the collector has to make sure that a certain amount of anxiety is present."

Creation of fear and anxiety are not the preferred motives in accident prevention because of the ease with which they can develop into panic, even when closely controlled.

Dr. E. B. Hurlock's work with the effects of three carefully chosen incentives of the discipline motive are startling:

He used four groups: a control group which was given no incentives; a group which received high praise; a group which was given severe reproof in their own interest; and a group which was ignored, but heard the praise and reproof given the others since only the control group was separate.

Here are the results in terms of their performance and using the control group as 100.

Group	Performance
Control	100
Ignored	144
Reproved	158
Praised	180

Use of reproof as an incentive for the discipline motive resulted in

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(Full length — 50" to 54")

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Watertown 72, Mass.

CIRCLE 57 ON READER CARD

CIRCLE 79 ON READER CARD



contaminants off **FAST!**

HAWS SAFETY SHOWERS send torrents of rushing water from all angles — washing away dangerous irritants in a hurry! Slap open the conspicuous "Push to Operate" valve. Hard-running streams from 10 adjustable nozzles drench victims in seconds. You can depend on HAWS for the instant, *positive* first aid so vital until medical help arrives. This "Safety on tap" can mean the difference between temporary irritation and permanent injury. Get the facts! Write for HAWS new safety catalog. Do it today!

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126

58 per cent improvement over the control group. The ignored group, which heard the other incentives being used, improved its performance by 44 per cent over the control group.

The praised group increased its performance by 80 per cent over the control group. This is direct testimony as to the solely positive social approval motive's effectiveness, when praise is used as an incentive.

Praise was given to a captive group operating in a state of discipline, and the praise was warranted. This incentive (praise) can be associated with discipline and social approval motives. In this case it was closer to the discipline motive.

I have commented especially on ambivalent motives, particularly discipline, because of their key position and impact and because their nature and use has been so misunderstood. All on-the-job safety motivation takes place in a setting where discipline and controls exist as the way of life — not free choice as off the job.

When we motivate we select a goal, decide what motives are most closely related to the goal, then provide incentives which will appeal to the individual or group as satisfying these motives. Because of the possible mortality of motives it's best to use several, and choose incentives accordingly.

We don't supply or provide motives. We supply incentives which satisfy motives which already exist.

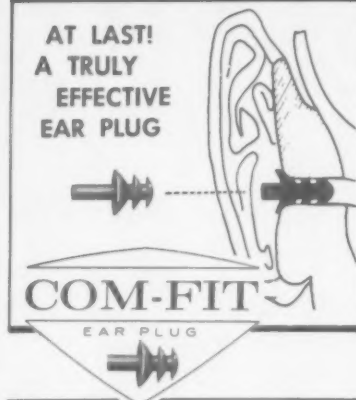
The diagram on page 118 includes the competition of motives in the "rescue breathing" case and multiple possible motives in the "no eye injury" case.

When we tried to get full use of safety glasses by paying for them and the prescriptions and using several motives, we got about 70 per cent reduction in eye injuries. But when we made it mandatory to wear safety glasses at all times on the job and enforced it, eye injuries were almost eliminated in the outside construction and maintenance forces concerned.

How to Successfully Motivate People for Safety. Regarding successful motivation of people for safety, I'm going to use four actual cases. Two concern group motiva-

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National Safety News, February, 1961

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**BLOCK
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Hold heavy trucks and trailers securely with ease. Prevent accidents caused by vehicle moving away from dock while loading or unloading. Safety Wheel Blocks are rugged, strong and practically indestructible, because they're STEEL CASTINGS. Easy to handle, Safety Wheel Blocks are your best insurance against costly accidents.

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BURGESS-MANNING COMPANY

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National Safety News, February, 1961

tion, and two deal with the motivation of individuals.

Case I, a large group — 17,000 women: 1955 freq. rate was 0.93. Placed last in 19 competing companies. 1957 freq. rate was 0.21. Placed third in 19 competing companies.

Case II, 300 men in outside construction work: Freq. rate 2.8 under normal working conditions. Freq. rate zero under disaster service restoration — abnormal hazardous working conditions.

Case III, individual employee (male): Individual bus driver with poor accident record given planned motivation resulting in 5-year accident-free performance to date.

Case IV, individual employee (male): Individual craftsman with 5-year accident-free record suffers loss of finger — neurotic paradox of motivation and the forced choice.

Since we took the time to explore just what motivation is and is not, and also developed and discussed basic definitions, all we have to do is put the pattern of successful motivation in flow diagram form and use it as a guide in discussing the four cases. (See page 30.)

The only new term introduced in the motivation pattern is "goal gradient." If the motivation is working, the nearer we get to a goal the stronger the motivation. It also applies when we divide a continuing, long-term goal into intermediate successive goals.

Case I. Careful study showed that safety programs and activities were oriented to men's needs, objectives, and thinking.

A women's committee on safety was organized to develop objectives, programs, materials, and activities in terms of women's motives, needs, incentives, interests, and thinking. Program activities were given to the women by female supervisors. In two years the women's frequency rate decreased from 0.93 to 0.21, and they moved from last to third place, bettering the men's performance. (See diagram, page 30.)

There were more motives and dozens of incentives used. Items were designed to follow the pattern of successful motivation. There was ample evidence they did.

Case II. This case differs from the preceding group motivation. It has situational motivating factors

**FOR
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PRODUCTION
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SOLDERING IRON
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Watertown 72, Mass.

CIRCLE 61 ON READER CARD

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which Case I did not have.

When hurricanes strike and telephone lines are down, construction crews and their equipment are rushed to the disaster area. They work day and night under hazardous conditions. Yet, there are far fewer injuries than under usual working conditions.

Looking at the pattern for successful motivation, we see the goal is sharply defined. Previously developed safety attitudes, habits, and training are brought into focus by the urgency of serving others. Achievement is constantly before them, as is information about progress, and warranted commendation and praise are quickly given by everyone, including the public.

Incentives coming from situational motives operate to strengthen the entire pattern of motivation. For some this incentive is the desire to help in time of need, for some the rewards of overtime. Group effort and individual rivalry within teams come into play.

The critical thing about situational motivation centers about one fact: Unless the situational impact has been preceded by sound safety attitude development, training, and habit formation, impact has nothing to build on and may increase injuries instead of preventing them.

Case III. In this and the following case, comments will be limited to unique aspects.

This case concerns a bus driver who had a poor accident record, but whose physical and mental qualifications were satisfactory.

The company psychologist and safety engineer developed this plan: Incentives were group and individual rivalry, financial rewards, and participation; motives were achievement, conformity, and identification.

Here's how it was done: The poor performer was put in a group of three drivers with good records; each driver would get a \$50 bonus at the end of an accident-free year; if all four drivers had an accident-free year, all would receive \$150.

The three good drivers assisted and worked on the poor one. He tried to conform and identify with the good ones. It worked so well that all drivers in that company now are competing on the Group-of-Four Plan.

Probably most would say, "Sure

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Enter extreme heat and total flame—for repairs, maintenance, wreckage clearance, close controls, rescue and emergencies.

- Widely used by industrial and municipal rescue squads
- Weighs only 26 lbs.
- Carrying Case
- Use with all breathing apparatus



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CIRCLE 65 ON READER CARD

National Safety News, February, 1961

it worked—they gave them some money.” Money was not the key. The same plan worked when there wasn’t a material reward. Rivalry turned the trick.

This ties in with research results on the value of rivalry as an incentive where no rewards were used. Dr. V. M. Sims used three groups.

1. A control group in which there was no special motivation.
2. A group in which only group rivalry and participation was used.
3. A group in which only individual rivalry and participation was used.

CIRCLE 67 ON READER CARD



Flash Box Opener

Push Button Safety Knife

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4 Boxes—1000 Tissues Each
Size 4 1/2" x 10 3/4"\$7.00
Dispenser Bracket for tissue.....75c ea.
Dispenser Bracket for water.....65c ea.
Water bottle with Spray Pump.....35c ea.

CIRCLE 66 ON READER CARD

Here are the relative results assigning the score of 100 as a starting base.

Group	Score	% Gain
Control	108	8
Group Rivalry	115	15
Individual		
Rivalry	153	53

The Group-of-Four Plan combined the motivating values of group and individual rivalry incentives in an effective manner, and these figures show why it worked well.

Case IV. This case illustrates the competition and clash of motives and their implementing incentives. Here's the story of the accident.

A craftsman with five years accident-free service had to make changes in equipment panels located 10 ft. above the floor. Another employee was using the ladder on the other side of the office. Instead of waiting a few minutes or walking across the office to get the ladder, the employee secured a small table 30 in. high and stood on it to make the adjustment. His supervisor saw him but did not stop him.

After making the adjustment, the employee (6 ft. 4 in. tall) decided to jump to the floor. As he did, his wedding ring caught on the equipment 8 ft. above the floor. His body and full weight being in motion, he couldn't stop. The ring severed his finger at the first joint. The remainder of the finger had to be amputated later.

The clash between motives ended with the motivation for safety, which had been working for five years, losing the battle. Notice the absence of the discipline motive, when it was needed to reinforce the ones that weren't functioning.

The Neurotic Paradox of Safety Motivation. This fourth case also depicts the underlying basic problem

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Porcelain Enamel
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Baked Enamel
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IN THESE PREMISES

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For 125 years, SAWYER-TOWER have researched new methods and fabrics to meet changing needs — and they constantly custom manufacture specific garments to meet special requirements, with prompt shipment assured. Send for literature, name of nearest dealer.



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NO-FOG®

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Lens Cleansing Tissues

Use Just Water, No Chemicals Needed

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- Reduce traffic accidents at blind corners inside and outside your plant — also at loading platforms.

Traffic Safety Mirrors are available in Convex or Flat glass. All have a Yellow and Black Safety Stripe Border.

Round Convex Mirror Sizes
13" • 18" • 26" • 36"

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SAWYER-TOWER garments are famous for their generous cut to assure comfortable fit, relieve stress points, provide longer wear — and for their seam structure — stitched for strength, sealed for safety. Send for literature, name of nearest dealer.



LINEMAN'S SUIT

SAWYER - TOWER, INC.
Watertown 72, Mass.

CIRCLE 71 ON READER CARD

of safety motivation — the neurotic paradox.

In his significant contribution to the new concepts on motivation, Dr. O. H. Mowrer, research professor of psychology, University of Illinois, said:

"Why does a person sometimes persist in unrewarding, self-defeating, and injurious behavior when he knows he should not, and is familiar with the safe, rewarding behavior?"

In our fourth case the employee had known and practiced safe procedure for five years. Research indicates we have not been fully conscious of the high motivating element in a forced choice between opposites. Opposition to our choice reinforces our unconscious drive to do things we are told not to do, and we have what is the commonest of all emotional blocks, pressure to resist anything that may be felt to be coercion.

This is the core of the motivation problem since we do not use perverted motivation to destroy the free spirit and creative initiative.

In the fourth case the discipline motive and incentives of direction and enforcement would have saved the day. Incentives must be personalized for the individual and work through the properly selected motives.

The more strongly the desired goal is seen and repeated, the stronger the motivation, particularly when the development of the proper attitude puts the desired goal in favored position.

How to Tell Whether Motivation Is Working. Four simple checks will determine this:

1. Effectiveness and efficiency of the desired learning is increased (other things being equal).
2. Individual or group efforts to achieve the goal are persistent.
3. The goal gradient effect is clearly evident.
4. The individual or group voluntarily expresses interest, satisfaction, and desire to achieve the goal.

These four tests were satisfactorily met in the first three cases and would be observable to anyone making the check. In the fourth case, when motivation failed, it was evident to the supervisor that the four tests were not being met and there was need for immediate action, shown in the flow diagram.

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MORSE Model 80 Barrel-Lift

Now... one man can safely handle liquid drum loads from 500 to 1,000 lbs.—raise, rotate, transport, tilt and drain 55 gal. drums. The mess, expense and hazards of spills, leaks, overflow and drum damage are eliminated. Sturdy, all steel welded construction... rubber tired wheels with ball bearings and rubber tired rear caster.



MAN • MINUTE • MONEY SAVERS!

MORSE Model 85 Drum-Karrier

Provides complete control. Easy one-man operation. Attaches to any monorail hoist... for all double chine drums 23" in diameter, 36" in height. Positive tilt locks hold drum in vertical position for carrying... provide control of tilt for mixing or dispensing. All steel welded construction.



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765 West Manlius Street, East Syracuse, N. Y.

SLIP-ON GUARD



NO ACCIDENT A DAY KEEPS THE DOCTOR AWAY

GETS-A-LITE GUARD and GUIDE

Quickly and Easily Installed
by Anyone—No
Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
- Made of indestructible spring steel wire. Nothing to break, get out of order or replace. Will last indefinitely.
- Once installed, GETS-A-LITE GUARD AND GUIDE is NEVER removed.
- Nothing to unlock, fuss with or lock, when changing lamps.
- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

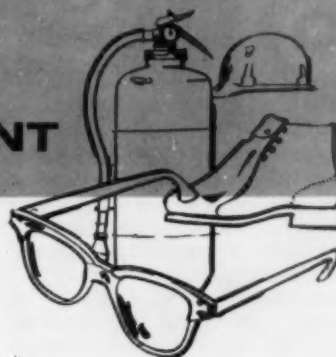
GETS-A-LITE CO. — Dept. NSN 261
3665 N. Milwaukee Ave., Chicago 41, Ill.

CIRCLE 73 ON READER CARD

National Safety News, February, 1961

NEW SAFETY EQUIPMENT

Products listed in this section have been reviewed by a committee of the Industrial Department of the National Safety Council. Only those which comply with the advertising policy of the National Safety Council are accepted. However, the information is based on literature from the manufacturer, and the Council does not accept responsibility for statements or claims made herein. Nor does the listing of a product in this section imply endorsement by the National Safety Council.



**Dispenser
Packed
With
Wipers**

Magic Heavy-Duty Wipers are now packaged with a disposable dispenser of heavy kraftboard. The dispenser can be wall-mounted with adhesive back or by brass eyelets. A window indicates when a refill packet is needed. The dispenser holds a packet of 760 sheets, and is packed in carton of 18 packets of the 4¾ by 8-in. lint-free wipers. THE SILICONE PAPER CO. OF AMERICA, INC., 230 Park Ave., New York, N.Y. (Item 301)

**Firm Improves
Flexible Mask Goggles**



A line of flexible mask goggles has been improved to make them more comfortable and safer to use. The improvements are:

1. New snap buttons to hold lens securely in frame. Lens can be removed quickly and easily for cleaning or replacement.
2. New recessed slots at sides of cups to fit over temples when worn with safety or personal prescription glasses. The mask, therefore, will not

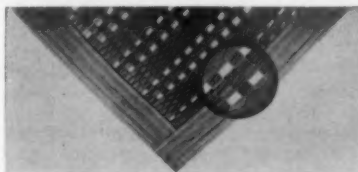
bulge away from the face but will fit snugly.

3. Increased eyecup depth to give additional ventilation.

4. Wider edge of mask to mold to contour of face.

The improvements have been made in all models — impact, chemical, welders' and chippers' goggles. The entire line consists of lightweight ventilated goggles. AMERICAN OPTICAL CO., SAFETY PRODUCTS DIV., Southbridge, Mass. (Item 302)

**Link Mat Has
Small Openings**



Koroseal-Vinyl Link Mats have ¼-by ¾-in. openings between links yet there is storage capacity to trap large quantities of dirt. Hundreds of ribs are built-in to eliminate slipping. Non-porous surfaces resist stains and discoloration. Sized to order in solid colors, with or without contrasting color inside border; or standard two-color design. Field designs made to specifications. Colors are red, green, gray, blue, orange, yellow, brown, white, and black. Mats come with matching color nosing, beveled or square, attached.

Another new item, the Deluxe Fluffed Link Mat, with a chenille-like finish which aids in removal of dust and dirt from shoes. In brown or gray tone field with red or green border. R. C. MUSSON RUBBER CO., AKRON, Ohio. (Item 303)



**Protection
Against
Rocket Fuel
Elements**

Rocket Propellant Gas Masks provide protection against dangerous elements in hypergolic liquid rocket propellants: red fuming nitric acid; unsymmetrical dimethyl hydrazine; hydrazine; hydrogen peroxide; kerosene; aniline; and splashes from nitrogen tetroxide and fluorine liquids.

Canister meets specifications of the Protective Developments Div., Army Chemical Research and Development Laboratories, Army Chemical Center, Maryland.

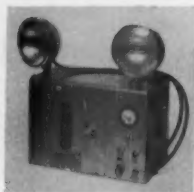
Available are: gas mask with full face-piece; gas mask with half face-piece; basic canister with standard threaded nozzle; and special military type canister with added filter protection against radioactive and bacteriological dusts.

Canisters have built-in inlet valves, orange color metal can, air-tight seals, four year shelf life, threaded nozzle, side mounted "D" rings for harness. Carried on front or back of wearer.

Masks are of black rubber. Full face mask directs inhaled air over safety lenses to deter fogging. Flexible corrugated breathing tubes, threaded connectors, metal guards and exhalation valves protect against splashing liquids.

Full or half face masks available with Tite Seal Headgear. WILLSON PRODUCTS DIV., Reading Pennsylvania. (Item 304)

For More Information—Circle Item Number on Reader Service Postcard



**Rechargeable
Emergency Light**

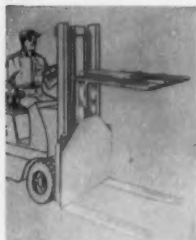
Emergency Light Model DR-409/50LAT with 50-Ampere Hour rechargeable battery, and Model DR-409/100LAT with 100-Ampere Hour rechargeable battery are Underwriters' Laboratories approved.

Transistor-controlled charging assures voltage control, maintains the 6-volt lead acid batteries charged condition automatically.

Operating without switches or dials, the units provide lighting on failure of normal lighting. Charging by A.C. is applied. Charging circuits and battery voltage are monitored by transistorized circuits, which will switch either to high or trickle charge rate.

Visible meter indicates battery voltage. Electrolyte level and multicolor specific gravity floats are visible through viewing window. Either Model can operate as many as eight 25-watt remote lamp assemblies. ELECTRO POWERPACS, INC., subsidiary of Hydra-Power Corp., 5 Hadley St., Cambridge 40, Mass.

(Item 305)



**Unit Checks
Unstable
Loads**

A newly designed, hydraulically operated load stabilizer aids safe transport of a variety of unstable loads. It holds palletized bottle cases, bags, boxes, drums and barrels while loads are being transported.

Loads which easily might separate, slip off or be bounced from skids or pallets are kept intact when moving over uneven surfaces, rounding corners, going up and down steep ramps and when entering or leaving ships, railway cars or highway trailers.

Employs a thin articulating pad for minimum clearance when stacking, loading or unloading. Unit is of all-welded construction, offers a minimum loss of load center, hardened slide bars to prevent galling and scoring, full-floating cylinder and pilot-operated check valve which insures

against loss of clamping pressure. Can be mounted on any make or model lift truck, and be combined with side-shifter, rotator or hydraulic clamp for special applications. Opening and closing ranges can be furnished to suit any load height. LITTLE GIANT PRODUCTS, INC., Peoria, Ill. 1530-50 N.E. Adams St.

(Item 306)

Hose Cabinets Are Trimless, Mount Flush



Four models of new Trimless HOZEGARD Fire Protection Cabinets install on any plane — even in the floor. Flush mounting and elimination of trim reduce the exposed portion to the size of the door.

The units feature knockouts for installation of 2½ inch pressure restricting angle valves and include 180°-swing, anti-foul hose racks mounted on the door instead of inside the cabinet. These racks accommodate from 25 to 100 feet of regular linen or Cotton rubber lined fire hose, depending upon the cabinet model chosen.

A hose clip makes the cabinet semi-automatic. When specified with this clip, the entire unit, — cabinet and equipment, is 100% UL listed.

Available in steel, aluminum, stainless, or bronze. Supplied with continuous hinges and chrome-plated handles. Optionals include flush steel doors, rosette ventilation openings, break glass latch shield and chrome-plated valve (s), couplings, fittings, nozzle and extinguishers. W. D. ALLEN MFG. CO., Bellwood, Ill.

(Item 307)

Press Safety Block On Jack Principle

A new, adjustable safety press block which reduces accident potential and shortens down time of power presses has been developed to assure maximum support of power presses during die servicing operations. Saf-T-Bloc is used for rapid snubbing of upper and lower dies while cleaning, chang-

ing or sharpening dies is performed.

A modified version of the bell base screw jack, the unit consists of three parts: a single base casting with integral handle houses a steel screw; the top of the screw is knurled for hand adjustment while on the press; a stop washer at the base of the screw prevents raising beyond safe limits. The unit weighs approximately 11 pounds, is available in various capacities and raises.

The bloc is attached to the press with a short length of chain and a safety plug. It is impossible to use the bloc before removing the plug from its position in the power control panel. Once the plug is removed, all power to the press is automatically cut off. DUFF-NORTON JACK DIV., DUFF-NORTON CO., Gateway Four, Pittsburgh 22, Pa.

(Item 308)

Floor and Deck Coating Is Plastic Based

A floor coating is claimed to have "built-in" traction that offers slip protection on surfaces where there is foot traffic. Can be applied on any clean, dry surface—inside or out—on wood, steel, or concrete.

The liquid safety tread contains abrasive materials emersed in a heavy-bodied liquid plastic base material. Said to be grease-resistant and impervious to many acids, oil and alcohol. Acts as a leveling agent by filling in cracks, etched surfaces, pock marks and blisters.

Available in red, gray, green, and hi-visibility yellow. COLONIAL REFINING & CHEMICAL CO., 20575 Center Ridge Road, Cleveland 16, Ohio.

(Item 309)



**Lens Liquids
Now In
Plastic**

The manufacturers of K-Lens-M lens cleaner, and anti-fogging liquid, now offer these products in a special round, tall pint bottle made of linear polyethylene. The bottle was designed to fit the Skyscraper Goggle Cleaning Station. Danger of breakage is greatly reduced. The WILKINS CO., INC., 220 Groton Ave., Cortland 44, N.Y.

(Item 310)

For More Information—Circle Item Number on Reader Service Postcard

Eyewear Features Larger Temples



The 3-D line of safety eyewear features temples which have a three dimensional offer over two square inches of bearing surface to assure better fit. The safety spectacles incorporate the use of a 5-barrel temple hinge, which allows interchange with temples and frames of most major brands. A new Lok-Tite temple can be easily removed and replaced without special tools. Two-tone styles in popular industrial colors and solid colors in high-lustre frames are provided with matching color or anodized aluminum temples. Available with cup or flatfold sideshields, with Optilite or heat treated safety glass lenses in either plano or prescription. Another innovation is the larger, more legible temple length markings. U. S. SAFETY SERVICE CO., 1535 Walnut, Kansas City 8, Mo.

(Item 311)



**Remote
Metered
Gas
Detector**

An instrument for the detection of dangerous or explosive vapor mixtures called "the Bilge Bug," is primarily intended for use aboard boats, but may also be used in other locations to detect concentrations of gasoline, natural gas and other combustible vapors.

Consisting of a control and indicator panel, sensor unit, and connecting cable assembly, the unit is supplied for 6 and 12 volts DC, and draws a current of 1.2 amperes. The sensor unit is installed where combustible mixtures may collect and the control unit is mounted in some convenient location such as the helm of a boat.

A pilot light indicates proper operation and illuminates the meter. Within seconds, the two platinum wire sensing elements will react to the presence

of vapors and indicate the condition on the meter. Following the check, if the reading is "safe," the instrument may be turned off and the engine started. ENGELHARD INDUSTRIES, INC., 75 Austin Street, Newark 2, N.J.

(Item 312)

Pack Provides Cold Chemically



A cold pack for first aid treatment has been introduced in the form of a plastic package of chemicals which becomes colder than ice when squeezed.

Requiring no refrigeration or ice, the unit provides 20°F. cold seconds after being squeezed, stays effective for about 30 minutes.

Consists of an outer bag of "Scotch-pak" brand polyester film No. 25A6 and an inner bag of polycel plastic. Cold occurs when the polycel is ruptured with slight pressure and its liquid mixes with chemical crystals in the outer bag.

Recommended for first aid use in recreation centers, schools, athletic departments, industry, dispensaries and clinics.

Packed two packages to a carton and eight cartons to a case. Cartons are made from strong cardboard to prevent damage. KWIK-KOLD, INC., Moberly, Mo.

(Item 313)



**Portable
Oxygen Unit
Features
Safety Valves**

A feature of Metrox Portable Medical Oxygen Units is the Metrox Valve which insures a flow of oxygen at any desired setting of the Regulator, which is calibrated for three, six, nine and twelve liters per minute. The pressure gauge provides a reading of oxygen remaining in the tank at all

times. Valve is equipped with a safety device which will release oxygen if the pressure should reach 2,600 p.s.i.

Unit includes carrying case, filled oxygen cylinder, valve and cylinder assembly, hose assembly and mask, re-charging attachment and special wrench to facilitate re-charging of the oxygen cylinder.

Masks, equipped with intake and exhaust valves for conversion from full oxygen intake to a mixture of oxygen and outside air are made of flexible, lightweight plastic. Available in two models, 56 or 305 liter capacities. METROX INC., 4335 Governor Printz Blvd., Wilmington, Del.

(Item 314)



**Two Step
Floor
Coating**

A new slip resistant surface finish is a brush-on or roll-on finish, based on thiokol polysulfide modified epoxy on which fine or coarse abrasive grains are sprinkled.

For application for floors, decks, ramps, docks, elevated walk-ways and stair treads. Adheres to wood, metal, cement and floor tile, providing a long-lasting, weather-resistant, surface. Particularly recommended for surfaces exposed to the weather, or that are oily or slick.

For expanded metal gratings, ladders and similar applications, the abrasive is mixed with the vehicle to prevent waste of grains by sprinkling.

The adhesive is laid down approximately 10 mil thick. Abrasive is sprinkled on at a rate of 25 lbs. per 100 sq. ft. Comes in units of about 150 and 1600 sq. ft. coverage. Larger sizes will be made on special order. Demonstrator panel available on request. CUSTOM ABRASIVE PRODUCTS Co., 373 W. State, Trenton, N.J.

(Item 315)

Unit Dispenses Sight Savers

A new lens cleaning station dispenses silicone treated Sight Savers tissues for cleaning and polishing eye glasses.

Featuring all-steel components and no moving parts, the new dry-type (no-liquid) dispenser delivers just one extra-large Sight Savers tissue at a time. Users obtain a tissue by placing

For More Information—Circle Item Number on Reader Service Postcard

the thumb directly on the tissue in the dispenser, and sliding the tissue down. A flat-front construction eliminates protruding knobs or plungers.

Easily mounted with screws or pressure-sensitive adhesive backing.

The industrial dispenser has a two-tone blue product name "logo" against a gold and white background. Metallic silver colored sides. Identified as Catalog no. 64 Sight Savers Cleaning Station. DOW CHEMICAL CO., Abbot Road Bldg., Midland, Mich.

(Item 316)



**Portable
Air Pack**

Scott Aviation Corporation of Lancaster, New York announces the Scott Ska-Pak, a new addition to the Scott line of respiratory protection equipment.

The Ska-Pak is emergency escape equipment designed to be worn by personnel who must work in areas where there is danger of exposure, without warning, to unbreathable atmospheres. Before entering such areas, the cylinder valve is opened, and the mask snapped to the shoulder harness. In case of exposure to a dangerous atmosphere, the oro-nasal mask is brought into position and held by gripping the mouth bit with the teeth.

The unit is available with a 4 or 7 cubic foot cylinder providing a breathing duration of approximately 5 and 10 minutes respectively. Equipped with the 6000M regulator. SCOTT AVIATION CORP., Lancaster, N.Y.

(Item 317)

Rubber Conduit Strip Eliminates Exposed Wiring

A new rubber conduit strip that embraces loose leads in a tunnel of rubber tapers a very thin cross section at the sides, to about 1/2 inch at the center. The rubber is tunnelled at the center point, forming a cushioned, protective container for loose wires.

Available in maximum lengths of 30 feet the conduit is grooved underneath to provide a non-slip grip that holds it safely to the floor. Materials

handling equipment and other wheeled vehicles can roll over the strip without damage to conduit or the wires it carries.

The new device is described and illustrated in the current issue of *Rubber Developments*. For a free copy, write NATURAL RUBBER BUREAU, 1631 K Street, N.W., Washington 6, D.C.

(Item 318)

Quarry Chain Links Are End Welded

For quarries and other industries which use alloy chains in the 3/4-in. to 1 1/4-in. sizes as slings in conjunction with stone dog hooks for digging and hauling stone, rock, marble, etc., a new high strength quarry chain has been introduced.

Utilizing ACCO Endweld chain links, the assembly is said to possess superior abrasion resistance than regular alloy quarry chains. With the weld at the end of the link, side bend properties have been increased to allow for sharp bends over stone edges and the stone dog ring. Special heat treatment yields a high proof test and increases chain strength.

Accoloy in the popular 3/4, 7/8, 1, 1 1/8 and 1 1/4 in. sizes. AMERICAN CHAIN AND CABLE CO. INC., 929 Connecticut Ave., Bridgeport 2, Conn.

(Item 319)



**Eye-Wash
Fountain
Remodeled**

A new emergency eye-wash fountain is smartly designed with cast Roll-Bright aluminum receptor, ready for wall mounting. Designated the Haws Model 7300, the unit provides first aid wherever acids, chemicals, volatile fuels, etc., are manufactured or used. Two chrome-plated brass fountain heads are angle mounted to direct a stream of water into the eyes, flooding away foreign matter.

A separate flow control valve for each fountain head assures proper water volume and pressure. A large push-type, lever-action valve provides operating control. Once activated, the fountain continues to flow, leaving both hands free, until the valve is manually closed. HAWS DRINKING FAUCET CO., Fourth and Page Streets, Berkeley 10, Calif.

(Item 320)



**Chipping,
Welding
Shield**

A low cost eyeshield for chipping or welding, the Chiporweld Eshield, has a one-piece, pliable, molded-plastic frame which rests low on the face to provide the wearer with a broad field of vision. Edges have flange-cushions, and the nose cradle is cupped. The adjustable elastic headband may be replaced.

For use with or without prescription glasses. Baffle design lets air circulate through ports while preventing foreign particles and light from entering.

Clear lenses for chipping and green lenses for welding are interchangeable. A plastic spacer frame between lenses deters fogging. DOCKSON CORP., 3839 Wabash, Detroit 8, Mich.

(Item 321)



**Bo's'n's
Chair Is
Adjustable**

An adjustable bo's'n's swing has 6000 lbs. tensile strength nylon webbing in risers and waist straps and three inch four-ply cotton body pads to hold worker. Fits any size worker.

Can be ordered with or without hardwood seat which straps into swing. Strap construction prevents seat from accidentally becoming disengaged. A spreader can also be attached to swing, spreading risers.

Available in double safe model with adjustable chest strap in addition to waist strap. ROSE MFG. 2700 W. Barberry Pl., Denver 4, Colo.

(Item 322)

Butyl Rubber Gloves For Missile Fuel Handling

Gloves made of butyl rubber are recommended by the manufacturer for use in handling new missile fuels and similar highly corrosive compounds. The OLYMPIC GLOVE CO., INC., 95 Madison Ave., New York 16, N.Y.

(Item 323)

For More Information—Circle Item Number on Reader Service Postcard

Backup Alarm Is Mechanical



A mechanical construction equipment reverse alarm which meets recently released specifications of the U. S. Army Corps of Engineers can be used on graders, tractors, scrapers, wheel loaders, track loaders, batch trucks, haulers and carry-alls.

The BULL/HORN is a mechanical, in use whether or not the motor is running. Its distinctive warning signal is directional. All moving parts lubricated at the time of the manufacture. E. D. BULLARD Co., Sausalito, Calif.

(Item 324)



**Carton
Displays
Extinguisher**

A new counter display-carton is available with Kidde's 2 1/2 pound pressurized dry chemical extinguisher. Closed, the carton measures 3 3/4 x 3 3/4 x 14 in. With the display flap up, its overall height is 20 3/4". WALTER KIDDE & Co., INC., Belleville 9, N.J.

(Item 325)

General Purpose Cleaner

New Texinol cleaner is commercially neutral concentrate for use on all surfaces which cannot be harmed by water. In addition to floors of all compositions, both resilient and rigid, the product may be used as a cleaner for tile walls, metal cabinets, lavatories, office furniture and all painted surfaces.

The cleaner leaves no soapy film and needs no rinsing. Said to penetrate and emulsify dirt and grit. According to the manufacturer, it will not scratch or mar surfaces to which it is applied. It contains no free alkalis, oils, injurious acids, or abrasives. Texinol does not insulate conductive flooring. WALTER G. LEGGE Co., INC., 101 Park Ave., New York 17, N.Y.

(Item 326)

Suit Has Cooling, Breathing Unit



A missile fuel handler's suit, developed by THE BENDIX CORPORATION, PIONEER-CENTRAL DIVISION for men who must work in areas where atmospheres are corrosive, toxic, oxygen deficient or otherwise harmful, features a back mounted unit to provide ventilating and breathing air within the totally enclosed suit. To purify, cool and dehumidify air being recir-

culated, the equipment includes a specially designed liquid-to-air heat exchanger and venturi injectors.

Air warmed by body heat and exhalation is drawn from the suit and passed over the heat exchanger fins. This action vaporizes and warms liquid air passing through the heat exchanger passages. Moisture in the recirculated air from the suit is frosted out on the heat exchanger fins, controlling humidity. Feature of the all aluminum heat exchanger is the use of internal fins and dip-brazed outer fins. BENDIX CORP., Pioneer-Central Div., Hickory Grove Road, Davenport, Iowa.

(Item 327)



**"Bump Cap"
For Light
Duty**

New, lightweight head protection known as the Bump Cap is light, comfortable, easy to store and clean, and inexpensive.

The cap is for workers in close quarters, such as overhead assembly lines, crowded engine and pump rooms, under the hoods of cars and trucks, under aircraft, and where men work near systems of conduits or pipes, such as breweries, distilleries and refrigeration plants.

Made of an impact-resistant plastic material, in white and yellow; crack, dent or shatter resistant. A top lining of foam cushions blows, and a foam sweatband holds the cap on the head and absorbs perspiration. E. D. BULLARD Co., Sausalito, Calif.

(Item 328)

For More Information—Circle Item Number on Reader Service Postcard

NEWS ITEMS

Honeywell Appoints Three To New Posts

Three administrative changes in organization have been announced by Minneapolis-Honeywell's Micro Switch division in Freeport, Ill.

JOHN K. LINCOLN, former eastern division sales manager for Micro Switch, has been named sales manager. He succeeds Frank Wilsey who recently was named vice president.

RICHARD F. JOHNSON has been named central area (Cleveland) sales manager, succeeding KENNETH J. CUMMING. CUMMING has been promoted to sales manager of Minneapolis-Honeywell's Marion Instrument division in Manchester, N.H.

Joining Micro Switch in 1943 as a field engineer, LINCOLN later was named manager of the New York sales office, then became manager of the company's eastern division. In 1954 he was named eastern sales

manager and transferred to Freeport. In his new position he will remain in Freeport.

JOHNSON started as a technician in 1943. In 1951 he was transferred to the Minneapolis branch and later became area manager. In 1957 he was named market manager in Freeport.

CUMMING joined the company in 1946 as a field engineer in the New York office and was named manager of the Boston office in 1950. In 1957 he became central area manager.



**Med. Supply
Names
Area Rep.**

Norman B. Hall

Appointment of **NORMAN B. HALL** as southeastern regional sales manager is announced by Medical Supply Co., Rockford, Ill.

HALL will have headquarters in Atlanta, Ga. Territory under his supervision will include Miss., Tenn., Ala., N.C., S.C., Ga., and Fla.

He served previously as assistant safety supervisor for Kaiser Aluminum and Chemical Corp.



Jack Weir

**Fibre-Metal
Names Weir
To S.W.**

JACK WEIR, formerly in industrial safety engineering at North American Aviation, Inc., Los Angeles, will work with welding and safety distributors in the southern California, Arizona and Nevada areas for Fibre-Metal Pacific, Inc.

He is currently a member of the Aero-Space Safety Council and Southern California Industrial Safety Society, and is a graduate in business administration.



Kenneth C. Tate

**Jackson Has
New North-
west Sales
Rep.**

KENNETH C. TATE, formerly with Aerojet Corp., has been appointed pacific northwest regional representative Jackson Products with headquarters in Portland. The southern part of the Pacific coast area will continue to be served by **GEORGE SLOAN**.

**Hull Fills Doxsey's
Post at Kidde**

JOHN HULL has been elected a vice president of Walter Kidde & Co. Inc., Belleville, N.J. HULL will be charged with management of the international div.

In 1959 he was elected an assistant vice president assigned to the company's international division and prior to that he was manager of pneumatic sales for aero-space division.

He is a graduate of Cornell University.

MR. ARTHUR M. DOXSEY, former vice president who headed the Kidde International Div., is retiring after 41 years but will be retained by the company on a consulting basis.



Samuel M. Bagno

**Kidde
Engineer
Named
Fellow**

SAMUEL M. BAGNO has been elected a fellow to the Institute of Radio Engineers "for his creative contributions in the field of instrumentation, medical electronics, and electronic aids to law enforcement."

BAGNO is Chief Engineer of the ultrasonic and detection alarms div. of Walter Kidde & Company, Inc., Clifton, N.J.

Dunn Named Alcoa Manager

Aluminum Co. of America has announced the appointment of **LAWRENCE M. DUNN** as development manager, building products and structures, a new area of responsibility in the company's development division.

The move follows an expansion of Alcoa's sales development division and its reorganization along industry lines.

DUNN will direct the activities of three division sections charged with furthering the use of aluminum in commercial buildings, residential buildings, highway products, and structural applications. A graduate of Iowa State College, he has been with Alcoa since 1943.

J. ROBERT STEMLER has been named manager of the highway products and structural section. He is a graduate of Lehigh University, and joined Alcoa in 1954.

Keleher V.P. at Sawyer-Tower



Robert W. Keleher



Bradford S. Ritchie

Sawyer-Tower, Inc., today announced the appointment of **ROBERT W. KELEHER** of Cohasset as vice president-marketing.

Formerly an executive vice president of Howes Leather Co., Boston, he was associated for almost twenty years with the textile industry and held executive positions with J. P. Stevens and with Pacific Mills. He is a graduate of Harvard and of the Harvard Graduate School of Business Administration.

The appointment of **BRADFORD S. RITCHIE** as technical director of the firm's protective clothing division was also announced. RITCHIE was vice president in charge of production and technical director at Farrington Texol Corp., Walpole. He is a member of ACS Rubber Group and has served on several advisory committees of the rubber, plastic and coatings industry.



Wesley W. Guptill

**Guptill Is
Tect
Sales
Manager**

WESLEY W. GUPTILL has been appointed general sales manager, Tect, Inc.

He will assume responsibility for the marketing and distribution of safety solvents, detergents and marine products throughout the U.S. and Canada.

GUPTILL has a degree in business administration from Dickinson College, was sales manager in the systems division of Remington Rand, and general sales manager with Pathe Inc. and Thermway Industries, Inc.

Around The Compass

Activities • Programs
Events

Fact Booklet Serves Dual Role

The Safety Council of Greater Lansing has printed a booklet, *YOUR Lansing Police*. The booklet includes a message from the mayor, a description of how the department is governed, a note from the chief of police, a brief history of organized police work, and a description of local divisions and bureaus. The publication includes pictures to illustrate operations.

Harold F. Lillie, director of the council, explains the publication is slanted toward better understanding by Lansing citizens of the duties and areas of service of the police department. This booklet serves as a "careers" publication for those interested in police work.

Safety Council Window Displays

The Seattle-King County Safety Council has prepared a display to exhibit its program and services. The display finished a successful four-week run in the lobby of the General Insurance Company Building, and then moved to the City Light Building and The Lawyers Title Insurance Co. Additional locations for display are scheduled.

The display provides the council with another opportunity for informing the citizens they serve concerning various programs conducted and services available.

Thought-Provoking Season's Greetings

The season's greetings of Lester L. Levy, president of the Greater Waco (Texas) Safety Council began: "How do you say 'Merry Christmas' to a boy who lost his dad on Christmas Eve? What will make the New Year happy for the man whose wife was killed because he had just one too many and lost control of his car?"

The message continues to compare the happy time of the holidays with the fact it is also a dangerous time, and the spirit of peace and good will — together with the prospects of the New Year — should make us more aware of our responsibility to our fellow men.

San Francisco Accidental Death Summary

The San Francisco Chapter of the National Safety Council has compiled a summary of local accidental deaths from 1945 through 1959. The San Francisco Police Department and the Department of Public Health supplied data, as well as the State of California Department of Industrial Relations.

Of the 7,207 deaths reported, 3,181 were home and 2,253 were public. Traffic accounted for 1,295 and the work total was 478.

More than 75 per cent of the total occurred in the home and public categories.

CIRCLE 80 ON READER CARD

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- Tool Storage
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Multiple steel plates . . . stronger than a solid block! Genuine brass-cylinder, pin-tumbler security. No finer padlock protection.

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Double-wall construction . . . 3 number brass locking mechanism. Available with "Key-Control" — one control key opens all locks.



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THE KENNEDY "VICTORY" CAP designed for GREATER SAFETY for all industrial Jobs!

Better protection for all the hair all the time because the full, wide, snood-type back of the Kennedy "Victory" Cap permits complete coverage. Easy to put on. Adjustable to all head sizes. 11 styles to choose from.

Manufacturers and distributors of a complete line of safety clothing and equipment.

Write for information regarding your needs.



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CIRCLE 81 ON READER CARD



TRADE PUBLICATIONS

These trade publications will keep you up-to-the-minute on new developments in safety equipment and health products. All catalogs are free, and will be sent without obligation. Just circle publication number on the Reader Service Postcard.

Silencers

A catalog showing "package" unit silencers has been issued by the Air Conditioning Department of Industrial Acoustics Company, Inc., 341 Jackson Avenue, New York 54. In addition to showing acoustic performance of these "Quiet-DUCT" silencers, the catalog lists the performance of the more than 44 unit sizes and 90 multiple unit sizes by airflow (from 185 cfm to 372,000 cfm) and by pressure drop (from 0.1 to 1.50 inches).

For more details circle No. 400
on enclosed return postal card.

Ultrasonic Burglar Detection

A 12-page, illustrated brochure describes Kidde ultrasonic burglar detection-alarm systems. The amount of Kidde Ultrasonic Alarm equipment depends on the size and character of space to be protected. The standard unit will protect an area up to 4,000 sq. ft. or a volume of 60,000 cu. ft. With power amplifier it will protect up to 12,000 sq. ft. or 180,000 cu. ft.

For more details circle No. 401
on enclosed return postal card.

Chemical Poster

For users of chemicals in the process industries field, Eco Engineering Co. has made available a wall sign which outlines dangers of industrial chemicals. Emphasis is on hazardous chemicals and the use of unsuitable solvents for cleaning equipment, the combination of which might cause explosions, fires and asphyxiations. Eco Engineering Co., 12 New York Avenue, Newark 1, N.J.

For more details circle No. 402
on enclosed return postal card.

Fire-Retardant Ceilings

A 12-page color booklet, describing a fire-protective acoustical lay-in system, has been published by the Armstrong Cork Company of Lancaster, Penn. The lay-in panels, about 2 by 4 ft. in size, rest in an exposed

grid system designed to withstand the intense heat of a fire. They can be lifted out to permit access to plumbing lines, air-conditioning ducts and other concealed utilities. Included in this publication are specifications for the lay-in units. The booklet is available without charge from the company.

For more details circle No. 403
on enclosed return postal card.

Air-Conditioning Smoke Controls

Bulletin 533 describes an "electric eye" unit which guards against smoke circulated by an air-conditioning system. Many times smoke may enter a system from an outside source, recirculated from fire in other parts of a system, or from spontaneous combustion in filters. If this smoke alarm is used, the density of gases is visible on the meter. At any predetermined volume of light cut-off, the unit will shut down the fan and flash a red danger signal. If desired, an audible alert signal may be added. Photomation, Inc., 96 S. Washington Ave., Bergenfield, N.J.

For more details circle No. 404
on enclosed return postal card.

Heavy-Duty Detergent

Designed to remove burned-on oil, grease and dirt from railroad equipment, Oakite RR Cleaner may be used in the cleaning tank or in steam-cleaning operations. It also may be used on steel, iron, brass, magnesium, and other metals, but is not recommended for aluminum or zinc. Solutions of the compound may be mixed with solvent detergents to remove soils, such as asphalt, which resist straight alkaline solutions.

For more details circle No. 405
on enclosed return postal card.

Radiochemical Membrane Filter

The membrane filter has uses in radiochemistry and nuclear process applications. This filter is a microporous plastic with uniform micron-sized

holes in it. The filter can be used to filter radioactive particles from fluid and gas streams. Particles filtered are retained on the surface of the filter. Energies of particles collected can be measured, because there is no self absorption on the filter. Manual No. 5 is available from Gelman Instrument Co., 706 North Main Street, Chelsea, Mich. and gives information on techniques useful in radiochemical application with 25 references.

For more details circle No. 406
on enclosed return postal card.

Chain Sling Warning Ring

Campbell Chain Company of York, Pa. has issued a four-page publication on their Sentry Slings which employs a device called a *warning ring*. Said to be stronger than the chain, it visibly elongates when the sling is overloaded. The brochure includes description, specifications, methods of checking elongation and instructing personnel in the use of the warning ring.

For more details circle No. 407
on enclosed return postal card.

Respiratory Dangers

Mine Safety Appliances Company is making available a pamphlet reprinted from the *A.M.A. Archives of Environmental Health*. Titled "Threshold Limit Values for 1960," this booklet lists values established at the Twenty-first Annual Meeting of the American Conference of Governmental Industrial Hygienists. Included is a table of recommended values for gases and vapors; toxic dusts, fumes, and mists; and mineral dusts. This provides a guide on safe atmospheric conditions to which a worker may be exposed during an eight-hour day. Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa.

For more details circle No. 408
on enclosed return postal card.

Vapor Inverters

Literature is available on this aid to air pollution control. As products are pumped into storage tanks, the vapor inverter vents the fumes and gases high into the air—protecting personnel working on tank roofs and surrounding ground areas from exposure to poisonous fumes and gases. The manufacturer claims it has an inverter to fit any size of any pressure relief valve made by any manufacturer. Johnson & Jennings Co., 350 Fifth Ave., New York 1.

For more details circle No. 409
on enclosed return postal card.

Filter Vacuum Cleaner

Designed for handling radioactive and toxic dusts, this portable vacuum cleaner is described in a four-page illustrated bulletin released by the Cambridge Filter Corp., 738 Erie Boulevard, Syracuse 1, N.Y. The bulletin details the filter design, maintenance procedure, tested efficiencies, and illustrates accessories and modifications available.

For more details circle No. 410
on enclosed return postal card.

"Sneak Preview"

This is the title of a four-page pamphlet issued by Turco Products, Inc., 24600 South Main St., Wilmington, Calif. Described is their 23-minute 16mm sound and color training film on dye penetrant inspection methods. The film demonstrates on-the-spot dye penetrant inspection from laboratory theory to authentic production-line techniques. Parts inspected during the film include: aircraft wing spars, pressure vessels, small parts, wheels, gears, and brake plates.

For more details circle No. 411
on enclosed return postal card.

Rope-Ology

Available from the MacWhyte Wire Rope Company is this four-page brochure describing uses of the firm's wire rope, from raising church steeples to aircraft cables on helicopters. Catalogs are also available on types of wire rope, including braided wire rope slings, monel metal, stainless steel, plastic coated and nylon coated wire rope, and wire rope assemblies. MacWhyte Wire Rope Co., 2905 Fourteenth Ave., Kenosha, Wis.

For more details circle No. 412
on enclosed return postal card.

CIRCLE 82 ON READER CARD

Positive Pocket-Sized Protection



...against breathing hazards

Now firemen can add precious minutes to their search for trapped victims. Rockwood's lightweight PocketAIRE, the most compact self-contained breathing apparatus made, permits firemen to put in action faster and work more efficiently without hindrance by bulky equipment. PocketAIRE is small enough to fit in pocket, clamp to fire coat or be worn in a shoulder harness.

What's more, by using pure, clean oxygen PocketAIRE supplies the most concentrated, most effective element to safeguard human breathing. Another extra protection feature, on all PocketAIRE units, is the safety cylinder that allows 5 minutes for escape. Three models are available for a full 30 min-



utes... a full 20 minutes and a full 10 minutes. Cost pennies to refill and no maintenance required.

Protect every fireman in your department with economical, safe, simple to use Rockwood PocketAIRE.

For more details, write to ROCKWOOD SPRINKLER COMPANY, 2032 Harlow St., Worcester 5, Mass.



ROCKWOOD SPRINKLER COMPANY

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Distributors in all principal cities



A 'COOL' Holder for a HOT Soldering Iron...

The LaGrange Soldering Iron Holder!

Protect against serious burns and the threat of fires. Insure ease of handling and stepped-up production—install the LaGrange Soldering Iron Holder for All your operators. Made of perforated cadmium plated steel for maximum air circulation, providing a handy, safe receptacle for the hot soldering iron.

Distributors Wanted

LaGRANGE MACHINE CO.

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Pleasant Valley, N.Y.

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Bacharach Ind. Inst. Co.	49	114				Safety Box Toe Co.	IFC	IFC
Carbon monoxide indicator						Steel toes for safety shoes		
Bausch & Lomb Inc.	22	89	Iron Age Safety Shoe Div.,			Sawyer-Tower, Inc.	57,61	125,127
Acetate safety frames			H. Childs & Co., Inc.	7	57	Industrial safety garments	69,71	129,130
Bethlehem Steel Co.	26	95	Safety shoes			Scott Aviation Corp.	10	48-49
Wire Rope Slings						Respiratory protective equipment		
Bouten, H. L. Co.	53	116				Sigma Engineering Co.	74	126
Eye Protection Equipment			Jackson Products Air Reduction			Ear plugs		
Brossard, Lester L. Co.	56	125	Sales Co.	28	97	Silver, Fred, Inc.	70	130
Hand creams			Helmets & visors			Safety mirrors		
Bullard, E. D. Co.	21	66	Jamac, Inc.	42	109	Sol-Speedi-Dri; Div. of Minerals		
Back-up Alarm			Protective clothing			& Chemicals Philipp Corp.	20	65
Burgess-Manning Co.,			Junkin Safety Appl. Co.	36	110	Oil and grease absorbent		
Acousti-Booth Div.	59	127	Punch press guards			Standard Signs, Inc.	68	129
Acousti-Booths						Safety signs		
						Stonehouse Signs, Inc.	40	107
						Industrial Safety signs		
Calumet Steel Castings Corp.	75	127	Kennedy-Ingalls, Inc.	81	137	Surgical Mechanical Research, Inc.	37	110
Safety Wheel Blocks			Women's caps			Ear stoppers		
Carhoff Co.	66	129	Kidde, Walter & Co., Inc.	41	108			
Lens cleaning tissues			Carbon dioxide extinguishing systems					
Carpenter Mfg. Co.	52	116	Kimberly-Clark Corp.	4	7			
Emergency Lighting			Disposable wipers					
Chicago Eye Shield Co.	18C	18C				Taylor, S. G. Chain Co.	44	105
Safety glasses						Steel alloy slings		
Columbus McKinnon Chain Corp.	55	117	LaGrange Machine Co.	82	139	Tect, Inc.	77	92
Alloy steel chain			Soldering iron holder			Stabilized 1, 1, 1 - Trichloroethane		
Coppus Engineering Corp.	51	129	Lehigh Safety Shoe Co.	2	3			
Portable Ventilator-Exhausters			Safety shoes					
			Littell, F. J. Machine Co.	45	112	U-C Lite Mfg. Co.	64	12
			Pres-Vac safety feeders and ejectors			Emergency lights		
Dockson Corp.	25	102				U. S. Borax & Chemical Corp.	9	5
Eyeshields						Weed-killing chemicals		
DuPont, E. I. De Nemours & Co.,						U. S. Safety Service Co.	6	11
Industrial & Biochemicals Dept. ..	35	53	Master Lock Co.	80	137	Eye protection equipment		
Flame retardant chemicals			Padlocks			Union Wire Rope Corp.	32	101
			McAn, Thom Safety Shoe Div.	18	63	Wire rope slings and hoist lines		
			Safety shoes					
Edmont Inc.	15	59	Merrill Brothers	54	117			
Job-fitted gloves			Material handling devices					
Ellwood Safety Appl. Co.	34	111	Metrox Inc.	78	94	Wagner Sign Service Inc.	16	60
Foot, leg, and toe protection			Portable medical oxygen			Changeable copy safety signs		
Employers Mutual of Wausau	38	103	Mine Safety Appl. Co.	3	4-5	Wiesman Mfg. Co.	63	128
Workmen's compensation insurance			Eye Protection			Power press guards		
			Morse Mfg. Co., Inc.	72	130	Wilkins Co. Inc.	31	100
			Barrel-Lift, Drum-Karrier			Lens cleaning & anti-fogging products		
						Williams Jewelry & Mfg. Co.	76	118
						Safety incentives		
Fendall Co.	12	52				Willson Products Div.		
Safety glasses			Oval Wood Dish Corp.	47	113	Ray-O-Vac Co.	9	45-46
Flash Mfg. Co.	67	129	Disposable spoons with safety message			Respiratory protective equipment		
Office Shipping knives						Wilson Rubber Co.	14	15
Frammelt Industries	58	126				Rubber & coated gloves		
Welding Safety Shields						Wilder Mfg. Co., Inc.	60	127
Fyrepel Products Inc.	65	128	Patent Scaffolding Co.	24	93	Soldering Iron Holder		
Fire entry-rescue suit			Scaffolding					

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85 Post St., GARfield 1-7950

Los Angeles: Duncan A. Scott & Co.
1901 W. 8th St., DUnkirk 8-4151

Use the **READER SERVICE POSTCARD**

to obtain more information on . . .

- **Advertised Products**

Here's how it works—

Printed below are two identical Reader Service postcards—the bottom one for your use; the top one for use by any other reader of this issue. All Advertisements, New Safety Equipment announcements, Trade

- **New Safety Equipment**

- **Trade Literature**

Publication listings carry item numbers corresponding to the numbers printed on the cards. Just circle the numbers of the items you want to know more about and send us the postage-free card. We'll have the full information or sample copies sent to you—without obligation.

Advertised Products

— feature equipment and services that will help you solve accident problems in your plant. Instead of making a "mental note," make sure you get full information by sending in the card. If no item number appears with an ad, it will be found on the opposite page, next to the arrow. Cover position ads are shown on the cards as: IFC — inside front cover; IBC — inside back cover; BC — back cover.

New Safety Equipment

— shown in the special section has been carefully reviewed. Only new products or newsworthy improvements in existing equipment are considered eligible for this section.

Trade Publications

— are catalogs, brochures, spec sheets and booklets — a wealth of helpful literature — describing equipment and services that will assist you in comparing before you buy. You can build a valuable safety equipment reference file with these free publications.

IMPORTANT—Be sure to fill in your name, organization and address in the space provided on this side of the postcard.

National Safety News
February, 1961

use the cards below to get more information on products advertised, new safety equipment, and new trade literature . . .

Please send me more information on the items circled below:

PRODUCTS ADVERTISED:

IFC	IBC	BC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122
123	124	125																						

NEW SAFETY EQUIPMENT:

301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350

TRADE PUBLICATIONS:

400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424
425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449

(Please print your name and address in full—do not abbreviate)

NAME _____ POSITION _____

COMPANY _____

ADDRESS _____ CITY & STATE _____

FEBRUARY, 1961

(Good until April 30, 1961)

Please send me more information on the items circled below:

PRODUCTS ADVERTISED:

IFC	IBC	BC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122
123	124	125																						

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301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350

TRADE PUBLICATIONS:

400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424
425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449

(Please print your name and address in full—do not abbreviate)

NAME _____ POSITION _____

COMPANY _____

ADDRESS _____ CITY & STATE _____

FEBRUARY, 1961

(Good until April 30, 1961)

The advertising pages of the News
... your guide to products of importance
and help to your plant safety program

Keep up-to-the-minute on all the latest advances in industrial safety products and services through the advertising pages and new safety equipment features in the NATIONAL SAFETY NEWS.

Should you want additional information or special consultation on your specific problems, don't hesitate to write to the manufacturers. They welcome your inquiries and will answer your questions without obligation.

Although the Council does not test or examine the products advertised or mentioned in the editorial features, staff engineers and technicians review all product information in an effort to determine that descriptions and performance claims are accurate. It should not be construed, however, that commercial products are approved or endorsed by the National Safety Council.

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Before you mail your
Reader Service
postcard . . .

TAKE
ANOTHER
LOOK
AT

- the ADVERTISING pages
- the NEW SAFETY EQUIPMENT section
- the TRADE PUBLICATION section

Make sure all the items you want to know more about are circled . . . check to make sure your name, organization, and address are printed on the reverse side of the postcard . . . THEN mail it today.

National Safety News
February, 1961

Designed to further simplify your Safety Glass inventory

NOW

Get

1 FRAME
with
2 UNIVERSAL FEATURES...

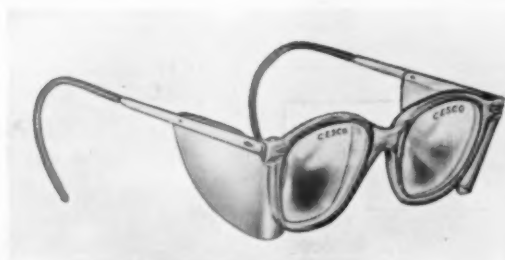


New CESCO Polyfit Bridge and New CESCO Interchangeable Temples

• Here's how to go all the way in simplifying inventory with a single safety glass that will fit the vast majority of your workers. New CESCO Polyfit frames have not one but two features to make them adaptable to the widest range of nose and facial contours. New Polyfit bridge design is amazingly comfortable on most individuals—thus eliminating the need to carry a large inventory of bridge sizes.

But in addition, CESCO Polyfit frames also feature gleaming nickel-silver temples which are interchangeable with other CESCO plastic frame glasses or with most safety glasses equipped with 5-barrel hinges—regardless of color. Sur-Loc pins fasten temples to frame. Tapered temples come in two styles—cable or spatula. Polyfit frames in flesh tone plastic are available with or without side shields.

- Your choice of two sizes: No. 316 (46 x 39mm), No. 318 (48 x 41mm)
- Popular F7 shape lenses are removable for easy "on-the-spot" repair



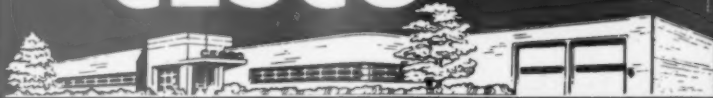
NOW...with Flat Fold Side Shields

For all-around eye protection, get CESCO Polyfit frames with flat fold side shields. Temples, with clear or green plastic shields attached, fold flat to frame for easy storage and carrying. Other features are the same as those described above.

- Two Sizes: No. 316FS (46 x 39mm), No. 318FS (48 x 41mm)



CESCO FOR SAFETY



CHICAGO EYE SHIELD COMPANY
2700 West Roosevelt Street, Chicago 28, Illinois

CIRCLE 18C ON READER CARD

NEWS FROM AO



Easy way to cut dust hazards

Where nuisance dusts cause discomfort and infections that reduce worker efficiency, the combination of an AO sweatband and R-9100 respirator is a natural. These easily-cleaned, cellulose sponge sweatbands are 9" long, designed to cover the temple areas and keep perspiration from carrying foreign particles into the eyes. Result: clearer vision,

and *reduced eye dispensary cases.*

The AO R-9100 is the lightest, least expensive Bureau of Mines approved respirator you can find for pneumoconiosis-producing and nuisance dusts. Weighing only 2 oz., this compact respirator is comfortable to wear and easy to breathe through. Felt filter provides approximately 22 sq. in. of area, can

be quickly cleaned with a shake, slap or air hose. A companion model, R-9100T is approved for dusts not significantly more toxic than lead.

For further information and prices on sweatbands and R-9100 respirators, contact your nearest AO Safety Products Representative, or write direct for detailed folder S-1298.

Your Surest Protection . . . AO SURE-GUARD Products

American  Optical
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SAFETY PRODUCTS DIVISION • SOUTHBRIDGE, MASSACHUSETTS
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